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ABSTRACT

The study described in this report was conducted by the Los Angeles Community College District (LACCD) to provide a basis for a master plan for health occupation programs and facilities that would meet the educational purposes and needs, workforce demands, and criteria for effective resource management of the district. After discussing the increased need for allied health workers and increasing fiscal constraints, the report describes the study's methodology. This involved: (1) a survey of present employment needs for trained health occupation personnel in Los Angeles; (2) a survey of local educational providers of health occupation training; (3) an assessment of current health occupation programs in the district; and (4) a forecast for future personnel needs using a Delphi survey technique. Next, the results of each of the surveys and assessment are presented. A summary section presents conclusions, such as that the demand for programs training registered nurses far exceeds any other need for health occupation personnel and includes demands for variation in both level and type of specialization. The report also indicates a growing demand for specialized technician and medical office personnel training. Appendices include data on health occupation employment opportunities and salaries; enrollment data in LACCD health programs for 1977-79; occupation descriptions; the employer survey sampling design and response rate; and all survey instruments. (AYC)

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HEALTH OCCUPATIONAL PROGRAM NEEDS IN THE LOS ANGELES COMMUNITY COLLEGE DISTRICT

A Report of Study Results

July, 1981

Office of Educational Planning and Resource Development

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LOS ANGELES COMMUNITY COLLEGE DISTRICT

JC 810 515

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TABLE OF CONTENTS

List of Tables, Figures, and Appendices iii

Acknowledgements v

Abstract vii

Introduction 1

The Employer Survey 6

The Education Survey 16

The Assessment of Current Programs 23

The Delphi Survey 41

Summary 47

LIST OF TABLES, FIGURES, AND APPENDICES

Table 1 Health Occupations in Rank Order of Number of Persons Employed (Full- and Part-time) in Each Occupational Category 8

Table 2 Health Occupations Reporting Substantial Current and Future Personnel Shortages in Rank Order of Need 10

Table 3 Employee, Job Opportunity, Annual Starting Salary, and Personnel Supply Information about Major Health Occupational Groups in Rank Order of Group Annual Starting Salary 11

Table 4 Health Occupations in Rank Order of Median Annual Starting Salary 12

Table 5 Health Occupation Employment by Type of Employer Group 15

Table 6 Frequency of Educational Programs in Health Occupations by Types of Institutions and Occupational Groups 18

Figure 1 Histogram of the Number of Programs in Health Occupations Offered by Area Educational Institutions 21

Table 7 Duplicated Enrollment, WSCH, FTE, WSCH/FTE, and Change in WSCH Fall 1977-79 in District Health Occupation Programs 24

Table 8 District Health Occupation Programs by Rank Order of Enrollment, WSCH, FTE, WSCH/FTE, and Fall 1977-79 Change in WSCH 26

Table 9 Grade Distribution and Retention Rates of District Health Occupation Programs 29

Table 10 Grade Distribution and Retention Rates of Programs by Occupational Groups 30

Table 11 Rank and Average Rank Comparisons of District Health Occupation Programs by Measures of Scale, Growth, Load, Job, and Salary Potential 31

Table 12	WSCH in District Health Occupation Programs Compared to Employment within Occupational Groups . . .	36
Table 13	Future Needs for Educational Programs in the Health Occupations, in Rank Order of Average Ratings Assigned by Delphi Respondents	43
Table 14	Future Needs for Educational Programs in Health Occupations, Grouped in Occupational and Topical Employment Categories	45
Appendix A	Health Occupation Employment Opportunity and Salary in Rank Order of Median Annual Starting Salary within Major Occupational Groups	50
Appendix B	Duplicated Enrollment, WSCH, WSCH/FTE, and Change in WSCH Fall 1977-79 of District Health Occupation Programs, by College, in Rank Order of Highest Fall 1979 Program Enrollment	53
Appendix C	Occupation Descriptions	58
Appendix D	Survey Sampling Design and Response Rates	67
Appendix E	The Employer Survey	69
Appendix F	The Education Survey	75
Appendix G	The Delphi Survey (First Iteration)	82
Appendix H	The Delphi Survey (Second Iteration)	84
Appendix I	Membership, the Chancellor's Advisory Committee on Health Occupational Programs	89

05

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These many individual efforts to provide meaningful planning information for the development of health occupational programs in the Los Angeles Community College District are very much appreciated.

ABSTRACT

The development of health occupation programs and facilities in the Los Angeles Community College District requires resource commitments that are increasingly difficult in the post-Proposition 13 era of limited public education funding. College requests for program and facilities expansion, coupled with resource constraints, have prompted this study of program development needs in the health occupations.

The findings persuasively demonstrate the need for nursing related programs, limited development of technician/assistant programs, and the need to provide medical specializations in programs training office personnel. These findings include:

- Thirty-five percent of the 22,654 full- and part-time health occupation positions identified by the manpower survey were in registered nursing. An additional 19% were in licensed vocational nursing.
- The greatest estimated future shortages are in the nursing areas. Eighty percent of the respondents indicated future shortages for registered nurses; 62% indicated future shortages for licensed vocational nurses. More than half of the annual full- and part-time openings anticipated by respondents were for registered and licensed vocational nurses.
- Registered nursing is an attractive occupational field not only because of high demand, but because salaries are higher than in many other health occupations and because opportunities exist for advancement as managers or specialists.
- Community colleges are major providers of health occupation training, particularly for registered and licensed vocational nursing. Of the 22 registered nursing programs offered by the 154 area educational providers surveyed, 20 were offered by community colleges. Sixteen of the 22 licensed vocational nursing programs were offered by community colleges.
- Technical occupations rank third among seven health occupation categories in the number of current employees, annual job openings, and in median entering salary.

- Assistant positions, in less demand and less well paid than are technical positions, often provide entry into related technical or professional fields.

- Office and semi-skilled occupations are most often offered by proprietary, adult, or occupational schools. Office occupations, however, are low cost and can be incorporated into existing community college business and office administration curricula.

Program development will require a reassessment of institutional objectives and priorities, and the appropriate allocation of financial resources.

Health Occupational Program Needs in the
Los Angeles Community College District

INTRODUCTION

It was no coincidence that the Office of Educational Planning and Resource Development (OEPRD) was created following the 1978 passage of Proposition 13. Since that time, the need for program and facilities expansion has collided with accutely reduced resources. Effective program development has increasingly required a systematic means of evaluating programs, re-assessing purposes, and determining priorities. A planning cycle was subsequently developed, linking educational planning and evaluation to budget and facilities planning. The new OEPRD assumed responsibility for college master plans, annual reports, and new program approvals. It became apparent from these general planning activities that studies in greater depth were needed in a number of program areas. Health occupations was the first area selected for study; several circumstances prompted this choice.

The recent dedication of the handsome new nursing building at Harbor may have marked the end of an era. Post-Proposition 13 plans for nursing facilities at Pierce and Valley Colleges have ground to halt in the face of limited capital construction funds and new districtwide planning requirements. Approval of the registered nursing program at West College barely squeaked by Sacramento, and Mission College's cry for nursing/allied health programs has largely fallen on deaf ears. Thus, the high costs of training have raised questions about further expansion. At the same time, local politicians have begun to ask what might be done to ease the critical shortage of nurses.

It is intended that this health occupations study be used to help reconcile development needs with occupational demand and educational needs, purposes, and costs. This report is expected to provide a basis for establishing a districtwide master plan for the development of health occupation educational programs and facilities which successfully meets educational purposes and needs, workforce demands, and criteria for effective resource management.

Research Methodology

The initial research design was developed by OEPRD and presented to the Chancellor's Advisory Committee on Health Occupation Programs. This Committee was established for the purpose of advising OEPRD regarding research design, methodology, and interpretation of results. Its membership is made up of LACCD college staff appointed by deans of instruction, expert community representatives recommended by these designees, and representatives from the District administrative office. The membership of this Committee is presented in Appendix I.

Four types of data were collected:

1. A survey of present employment needs for trained health occupation personnel within the Los Angeles area.
2. A survey of local educational providers of health occupation training.
3. An assessment of current District health occupation programs.
4. A forecast of future health occupation personnel needs, utilizing a Delphi survey technique.

Sampling techniques and response rates for the surveys (Employer Survey, Education Survey, and Delphi Survey) are presented in Appendix D. Occupational categories for each of the surveys utilized the American Society

of Allied Health Professions' 1975 Inventory of Health Occupation Education and the Department of Labor's Dictionary of Occupational Titles.

The extensive Employer Survey required information on current full- and part-time employees, annual number of openings and starting salaries, and estimated surplus or shortage of current and future personnel by each of 14 general and 40 specific categories (plus "other"). Worthy of note is the low response rate (36%) for the Employer Survey, even after follow-up inquiries which doubled the original response.

The Education Survey utilized the same general occupational categories but permitted respondents the choice of specific occupational titles under each category. The Education Survey requested information regarding the number of graduates by associate degree (or less) certification as well as plans for program expansion or deletion. However, a poor response rate on anticipated changes limited the results to data on current programs by types of educational institutions. Survey response was 57 percent, reduced by the lower response rate of proprietary and adult schools than of four-year or community colleges.

The Delphi Survey was sent to 60 health occupation "experts" recommended by Committee members or other persons consulted. The first iteration was an open request for suggestions of "emergent occupations" in the health field. The second iteration, utilizing suggestions from the first response, asked respondents to rate suggestions from 1 (low) to 9 (high), and add further emergent occupations which they were also asked to rate. The results in this report are from this second response. The Delphi Survey response was 43 percent for this second iteration.

The assessment of current educational programs made use of existing District records to conduct a limited evaluation of their efficiency and quality. Time constraints necessitated use of purely quantative, available data; no attempt was made to evaluate the efficacy of specific program design or implementation. Efficiency measures of current educational programs included Fall 1977 and Fall 1979 enrollment, weekly student contact hours (WSCH), full-time equivalent faculty loads (FTE), and WSCH/FTE ratios. Each of these measures was broken down by categories established by the Student Accountability Model (SAM). These codes, also called "priority slants", essentially assign to courses a measure of vocational intensity (for example, apprenticeship courses would be assigned and "A" code while general purpose vocational course would be assigned an "E" code). Only courses within approved programs were assessed, and only courses with a SAM designation were included. Courses in anatomy, physiology, or English were therefore not included. The change in total WSCH between Fall 1977 and Fall 1979, years for which there was little change in total districtwide WSCH, were also computed to indicate change in offerings or student interest.

Quality measures included grade distribution, retention rates, and grade point averages within courses required by approved programs and with SAM designations. Data were summarized for programs, colleges, and districtwide totals.

An enormous amount of data has been collected. Limitations of the data, however, are many: modest survey response rates, errors of judgment in survey response, data input errors, and the superficiality of some of the

data measures or forms of analysis. There are, however, some strong trends in the results which can be further qualified by subsequent discussions and directed inquiry. It is the purpose of this report to stimulate a broadly based review and critique of districtwide program development in health occupations.

THE EMPLOYER SURVEY

Purpose and Design

The Employer Survey (Appendix E) was designed to assess manpower needs in health occupations by occupational categories, salary levels, and types of employers. The comprehensive list of health occupation categories used in this survey included only those categories for which community colleges can offer training. Assessed manpower needs are therefore directly related to community college educational program needs. The health occupational surveys were sent to a stratified random sample of Los Angeles County employers, divided into five geographic regions roughly corresponding to District college service areas. Results in this report are limited to the total sample, both for simplification and because results were similar across areas.

Employers surveyed were asked to indicate the number of employees and annual openings in each occupation, and whether or not shortages or surpluses in available manpower were anticipated. Entering salary data were also requested, under the assumption that college and student incentives to invest in training programs are at least partially related to students eventual salary benefits. There appears to be no justification for high cost training programs which result in little or no economic advantage to graduates.

While hospitals are expected to be major employers of health personnel, a wide variety of other employers must be recognized. Ten such employer groups were identified and these are listed in the discussion of sampling in Appendix D.

Both the low overall response rate (36%), and variation among types of employers in response rate (24%-68%) affect the scale and distribution of occupational categories represented in the survey results. Comparisons with the State of California Employment Development Department (EDD) health occupation employment for the Los Angeles/Long Beach area suggest that hospital staffing patterns are overrepresented in our survey results. Therefore, use of results should be limited to the identification of major trends and tentative employment patterns.

There are six principal findings of the Employer Survey:

1. The number and range of health occupation positions in the Los Angeles area is extensive.
2. Registered nursing represents the largest number employed within a single occupational role.
3. Technical fields are expanding and attractive.
4. The range of starting salaries among occupational categories is considerable.
5. Hospitals are major employers, particularly of registered and licensed vocational nurses.
6. Job opportunities in health occupations are substantial and expanding.

The extent of health occupation positions. There are a great many health occupation positions in the Los Angeles area. The Employer Survey gathered information about 22,654 full- and part-time positions; this represents 13% of the 168,878 positions identified by EDD in the Los Angeles/Long Beach area. Table 1 (page 8) presents 66 occupational categories identified by the survey in rank order of number employed.

The importance of registered nursing. Registered nursing has the largest cohort of employees for any occupational category surveyed and registered nurses represent 34% of all the identified health occupation employees.

Table 1

Health Occupations in Rank Order of Number of Persons Employed (Full- and Part-Time) in Each Occupational Category

Occupational Category	Number Currently Employed
Registered Nurse (including Specialty)	7782
Licensed Vocational Nurse	4352
Unit Clerk	1431
Other Nursing (Aide, Assistant, Attendant)	926
Health Care Facilities Housekeeper	666
Psychiatric Technician	564
Radiologic Technician	534
Medical Secretary	460
Respiratory Therapist	445
Medical Office Assistant	426
Medical Transcriptionist	371
Laboratory Assistant	366
Laboratory Technician	356
Pharmacy Technician	354
Geriatric Care Worker	349
Operating Room Technician	268
Respiratory Therapy Technician	250
Medical Record Technician	221
Homemaker/Home Health Aide	145
Rehabilitation Counselor	144
Mental Health Worker	137
Food Service Worker	134
Health Care Assistant Administrator	134
Physical Therapy Assistant	109
Cardiopulmonary Technician	100
Dental Assistant	93
Dietetic Technician	92
Cytotechnologist	91
Dietetic Assistant	91
Nuclear Medicine Technician	91
Alcohol/Drug Abuse Specialist	88
Community Health Worker	78
Electroencephalographic Technician	75
Biomedical Engineering Technician	74
Histologic Technician	71
Radiation Therapy Technician	64
Emergency Medical Technician	62
Human Services Technician	62
Housekeeper Aide	51
Mental Retardation Aide	50
Long-Term Care Administrator	48
Orthopedic Technician	40
Ophthalmic Dispenser	35
Dental Hygienist	33
Dental Technician	33
Dental Secretary	32
Occupational Therapy Assistant	30
Health Educator	24
Other Physical Therapy (Aide, Technician, Therapist)	24
Public Health Practitioner	24
Optometric Assistant	23
Physicians' Assistant, Primary Care	22
Medical Library Assistant	21
Dietician/Nutritionist	16
Other Health Professional (Microbiologist, Sanitarian)	16
Environmental Engineering Assistant	14
Ophthalmic Optician	11
Cook	9
Other Information/Communication (Librarian, Technician, Worker)	8
Pharmacist	7
Other Social Services/Counseling (Worker)	6
Occupational Therapist	5
Other Environmental Services (Director, Hygienist)	5
Other Vision Care (Technician)	5
Other Medical Instrumentation (Technician)	3
Other Orthopedic Services (Orthotist/Prosthetist)	3

As Table 2 (page 10) illustrates, the RN category has more annual openings and a higher perceived shortage than does any other category. In addition, the RN category had the highest median salary range.

Expanding technical positions. Technical fields also appear to be an attractive career choice among health occupations. Table 3 (page 11), presenting grouped data for seven occupational clusters, shows technical occupations to be the third highest in median annual starting salary. Salaries in technical fields are below those for RNs and non-nursing professionals, who usually require more extensive education. While demand varies among positions, shortages are estimated for technicians in nuclear medicine, biomedical engineering, radiation and respiratory therapy, medical records, and pharmacy areas (see Appendix A).

It should be noted that some assistant occupations, typically less well paid than technician levels, are often directly related to technician roles. Training programs which link assistant level training to technician and/or professional levels can maximize career ladder potential.

Salaries vary considerably. There is a considerable gradient of median annual starting salaries among health occupations. Table 3 and 4, as well as Appendix A, amply illustrate this point. Table 3 presents occupational categories in seven general groups (RNs, Non-Nursing Professionals, Technicians, LVNs, Office Workers, Assistants, and Semi-Skilled Workers) ranked by average annual starting salary. Table 4 (page 12) presents individual occupations in order of salary range from high to low. Appendix A presents detailed salary response and indicates the range of salary within categories.

Table 2

Health Occupations Reporting Substantial

Current and Future Personnel Shortages in Rank Order of Current Need

Occupational Category	Number Currently Employed	Annual Number of Openings	Percentage of Institutions Reporting Shortage		Median Salary Range (thousands)
			Current	Future	
Registered Nurse (nonspeciality)	7616	1084	81	80	18-19
Medical Transcriptionist	371	87	75	81	12-13
Homemaker/Home Health Aide	145	59	75	67	9-10
Nuclear Medical Technician	91	13	67	67	17-18
Biomedical Engineering Technician	74	8	53	62	17-18
Licensed Vocational Nurse	4352	555	52	62	12-13
Respiratory Therapist	445	87	50	58	13-14
Dental Secretary	32	2	42	73	12-13
Medical Secretary	460	33	41	44	12-13
Radiologic Technician	534	94	41	45	15-16
Radiation Therapy Technician	64	9	38	58	16-17
Respiratory Therapy Technician	250	83	37	65	12-13
Electroencephalographic Technician	75	14	30	47	12-13
Pharmacy Technician	354	68	27	52	11-12
Unit Clerk	1431	230	25	37	10-11
Physical Therapy Assistant	109	29	21	50	11-12

Includes any occupational category in which "Personnel Supply" information was provided by ten or more employers and in which "shortage" reports exceeded 10% in either the current or projected supplies.

Table 3

Personnel Supply and Job Opportunity Information for Major Health Occupational Groups

in Rank Order of Group Median Annual Starting Salary

Occupational Groups	Current # of Employees		Annual # of Openings		Median Annual Starting Salary	Annual Starting Salary in Thousands of Dollars (Percentage of Employees)															Personnel Supply (Percentage of Institutions Responding) Current			Future		
	Full-Time	Part-Time	Full-Time	Part-Time		% LT 9	% 9-10	% 10-11	% 11-12	% 12-13	% 13-14	% 14-15	% 15-16	% 16-17	% 17-18	% 18-19	% 19-20	% 20-25	% GE 25	% of Total	% Surplus	% Adequate	% Shortage	% Surplus	% Adequate	% Shortage
Registered Nursing (including Specialty)	5431	2351	842	273	17-18								1	11	38	24	23	3		92	1	19	80	3	17	80
Professional (Non-Nursing)	1011	135	130	45	15-16	1	1	3	4	5	8	13	21	11	4	9	2	10	8	82	10	69	21	12	63	25
Technical	2979	431	392	136	13-14		2	5	12	16	24	7	12	5	5	7	1	4	[illegible]	87	4	60	36	4	48	48
Lic. Voc. Nursing	3222	1130	371	184	12-13				6	56	31	4	1	1	1					96	4	44	52	5	33	62
Office	2141	579	292	96	11-12	2	14	24	24	23	7	5	1							90	4	55	41	3	46	51
Assistant	1520	314	176	57	9-10	41	19	11	7	13	2	4			1	1	1			80	6	68	26	6	54	40
Semi-Skilled	1212	198	194	64	LT 9	55	31	5	6	1		2								74	13	56	31	9	62	29

Table 4

Health Occupations in Rank Order of Median Annual Starting Salary in Thousands of Dollars

Annual Median Starting Salary Range	Occupational Category	Number Currently Employed
20-25	Health Care Assistant Administrator	134
	Long Term Care Administrator	48
	Dental Hygienist	33
	Dental Technician	33
	Other Health Professionals & Technicians	19
19-20	Public Health Practitioner	24
18-19	Registered Nurse	7616
	Laboratory Technician	356
	Physician's Assistant, Primary Care	22
	Registered Sanitarian	15
	Ophthalmic Optician	11
17-18	Nuclear Medicine Technician	91
	Cytotechnologist	91
	Biomedical Engineering Technician	74
	Health Educator	24
	Occupational Therapist	5
16-17	Specialty Registered Nurse	166
	Radiation Therapy Technician	64
	Ophthalmic Laboratory Technician	5
15-16	Radiologic Technician	534
	Histologic Technician	71
	Orthopedic Technician	40
	Dietician/Nutritionist	16
14-15	Rehabilitation Counselor	144
	Cardiopulmonary Technician	100
	Dietetic Technician	92
	Alcohol/Drug Specialist	88
13-14	Psychiatric Technician	564
	Respiratory Therapist	445
	Ophthalmic Dispenser	35
12-13	Licensed Vocational Nurse	4352
	Medical Secretary	460
	Medical Transcriptionist	371
	Laboratory Assistant	366
	Operating Room Technician	268
	Respiratory Therapy Technician	250
	Medical Record Technician	221

Table 4 (continued)

Annual Median Starting Salary Range	Occupational Category	Number Currently Employed
	Electroencephalographic Technician	75
	Emergency Medical Technician	62
	Dental Secretary	32
	Medical Library Assistant	21
11-12	Medical Office Assistant	426
	Pharmacy Technician	356
	Physical Therapy Assistant	109
	Dietetic Assistant	91
	Community Health Worker	78
	Occupational Therapy Assistant	30
	Environmental Engineering Assistant	14
10-11	Unit Clerk	1431
	Mental Health Assistant	137
	Dental Assistant	93
	Human Services Technologist	62
	Other Physical Therapy	24
	Cook	9
9-10	Health Care Facilities Housekeeper	666
	Homemaker/Home Health Aide	145
	Optometric Assistant	23
	Other Information-Communication	8
	Child Care Worker	6
LT 9	Nursing Aides	926
	Geriatric Care Worker	349
	Food Service Worker	134
	Housekeeper Aides	51

In general, workers in the first four occupational groups have more potential for increased earnings; income distribution within these occupations is wider and extends considerably further up the income ladder. Salary ranges in the lower bracket are more concentrated; further, they extend less far and less frequently into the upper salary ranges.

The range of median incomes is greater within occupational groups which have a number of individual occupational categories. Among technical occupations, for example, the range of median starting salaries is nearly equivalent to that among all occupations: from $10,000 to $25,000.

Hospitals are the major employers. Hospitals employed 86% of the workers reported in the sample. As Table 5 (page 15) indicates, proportions of registered (92%) and licensed vocational (89%) nurses, technicians (93%), and office workers (89%) are above this proportion. Semi-skilled workers (45%), largely employed instead by nursing homes, are employed in hospitals at a rate far below this proportion.

Hospitals are largely dependent on medical aid and insurance policies and practices; these factors influence the type and scale of services. At the same time, hospitals, particularly research and teaching hospitals, occupy a position close to the forefront of technological innovation and change in applied medicine. The advice and cooperation of hospital personnel will play an important role in the development and continuing modification of community college health occupation programs.

The Employer Survey results indicate several pervasive trends. The findings also provide a framework for the analysis of educational pro-

Table 5

Health Occupation Employment by Type of Employer

Employer Group	Percentage Employed							Percentage of Employers
	Registered Nurses	Non-Nursing Professionals	Technicians	Licensed Vocational Nurses	Office Workers	Assistants	Semi-Skilled	
Hospitals and Health Maintenance Organizations	92	85	93	89	89	85	45	86
Clinics	2	7	2	1	3	5	1	2
Home Health Agencies	3	1		2	1		8	2
Public Health Departments		3			1	1		1
Physicians and Dentists		2	3		3	2		1
Opticians/Optometrists		1	1					1
Business/Industrial		1						1
Nursing Homes	3	1	1	8	2	7	43	8
Laboratories			1					1
Percentage of Employed	35	4	15	13	11	6	10	100

viders, assessment of current District programs, and the Delphi Survey of future needs for programs training health occupation personnel.

THE EDUCATION SURVEY

Purpose and Design

The purpose of the Education Survey was to determine the extent to which educational providers train personnel to meet area manpower needs in health occupations. The survey instrument (Appendix F) elicited information about programs within the broad occupational categories used for the Employer Survey; educational program titles were provided by respondents within each of these categories.

Data requested for each program included the number of associate degree graduates or other certificate awards for 1978-79 and 1980-81, as well as changes in programs planned through 1985. All 162 post-secondary institutions in Los Angeles County preparing students in health occupations were sent surveys. Thirteen percent of these institutions were community colleges, 11% were four-year institutions, 9% hospital training programs, 23% proprietary schools, and 43% were adult or occupational schools. Response rates, detailed in Appendix D, averaged 57% (range of 36%-96%). Response rates were the highest for community colleges, four-year institutions, and hospitals (73%-96%); proprietary and adult or occupational schools responded at much lower rates (36%-43%). Survey totals therefore underrepresent proprietary and adult or occupational schools.

Breakdowns by associate or certificate levels have not been reported because only community colleges offered associate degrees. These programs frequently included certificate curricula as well. Incomplete or unreliable responses also precluded the reporting of planned changes in program design or awards.

Results

Principal findings include the following:

1. Health occupation programs available in the area are extensive and diverse.

2. The number of programs available by occupational groups is not always consistent with employment needs.

3. The most frequently offered programs are for registered and licensed vocational nursing.

4. The occupational group with the highest number of programs offered is the technical group.

5. The types of programs offered vary among educational providers.

6. Community colleges are major providers of health occupation programs.

The diversity of health occupation programs. Survey results identified 228 programs in 52 health occupations, most of which were included in the Employer Survey. Table 6 (page 18) lists these educational programs by occupational groups and by types of institutions.

The relationship of programs to employment needs. Comparisons between the number of educational programs and employability within occupational groups indicate discrepancies between the availability of programs and major employment needs. Comparisons of Tables 3 and 6 illustrate that registered and licensed vocational nursing ranked lower in their number

Table 6

Frequency of Educational Programs in Health Occupations
by Types of Institutions and Occupational Groups

Educational Programs within Occupational Groups	Types of Institutions				Total
	Community Colleges	Four-Year Institutions/ Hospitals	Occupational/ Adult Schools	Proprietary Schools	
Registered Nursing	20	3	1	0	24
Registered Nursing	20	1	1		22
Nurse Anesthetist		2			2
Non-Nursing Professional	13	4	1	1	19
Respiratory Therapist	8		1	1	10
Dental Hygiene	3				3
Prosthetist/Orthotist	2	1			3
Community Health Worker		1			1
Specialty in Blood Banking		1			1
Retraining for Foreign-Trained Physical Therapist		1			1
Technician	45	18	3	15	81
Radiologic Technology	9	7	1	2	19
Emergency Medical Technician	9		1	2	12
Dental Technology	2			5	7
Biomedical Instrumentation	3			1	4
Nuclear Medicine Technologist	1	3			4
Psychiatric Technician	3		1		4
EEG/EKG Technician	1			2	3
Health Care Facilities Management	3				3
Medical Records Technician	3				3
Medical Technician		3			3
Pharmacy Technician	2	1			3
Radiation Therapy Technician	3				3
Surgical/Operating Room Technician	1	1		1	3
Dietetic Tech./Food Services Mgt.	2				2
Human Services Technician	2				2
Ultrasound Technician		2			2
Cardiopulmonary Technician				1	1
Hemodialysis Technician	1				1
Optometric Technician				1	1
Radiologic Electronics		1			1

Table 6 (continued)

Educational Programs within Occupational Groups	Types of Institutions				Total
	Community Colleges	Four-Year Institutions/ Hospitals	Occupational/ Adult Schools	Proprietary Schools	
Licensed Vocational Nursing	16	0	3	3	22
Office Occupation	6	0	4	7	17
Medical Office Assistant	1		3	1	5
Medical Secretary	3		1		4
Medical Office Management				3	3
Medical Transcription	1			2	3
Medical Record Clerk Typist	1			1	2
Assistant	30	3	4	9	46
Medical Assistant	8	2	1	5	16
Dental Assisting	7		3	4	14
Dietetic Assistant	4				4
Physical Therapy Assistant	3	1			4
Human Relations Worker	3				3
Social Services Assistant	2				2
Emergency Room Assistant	1				1
Vision Care Technician	1				1
Mental Health Worker	1				1
Semi-Skilled Occupation	8	0	9	2	19
Nurse Assistant	5		7	1	13
Ward Clerk			1	1	2
Administrative Housekeeping	1				1
Allied Health Worker	1				1
Geriatric Case Worker	1				1
Home Health Aide			1		1
Total	138	28	25	37	228
Percentage	61	12	11	16	
Registered Nursing	83	13	4	0	
Non-Nursing Professional	68	21	5	5	
Technician	56	22	4	19	
Licensed Vocational Nursing	73	0	14	14	
Office Occupation	35	0	24	41	
Assistant	65	7	9	20	
Semi-Skilled Occupation	42	0	47	11	

of programs than in employment levels. The opposite was found for technical and assistant programs.

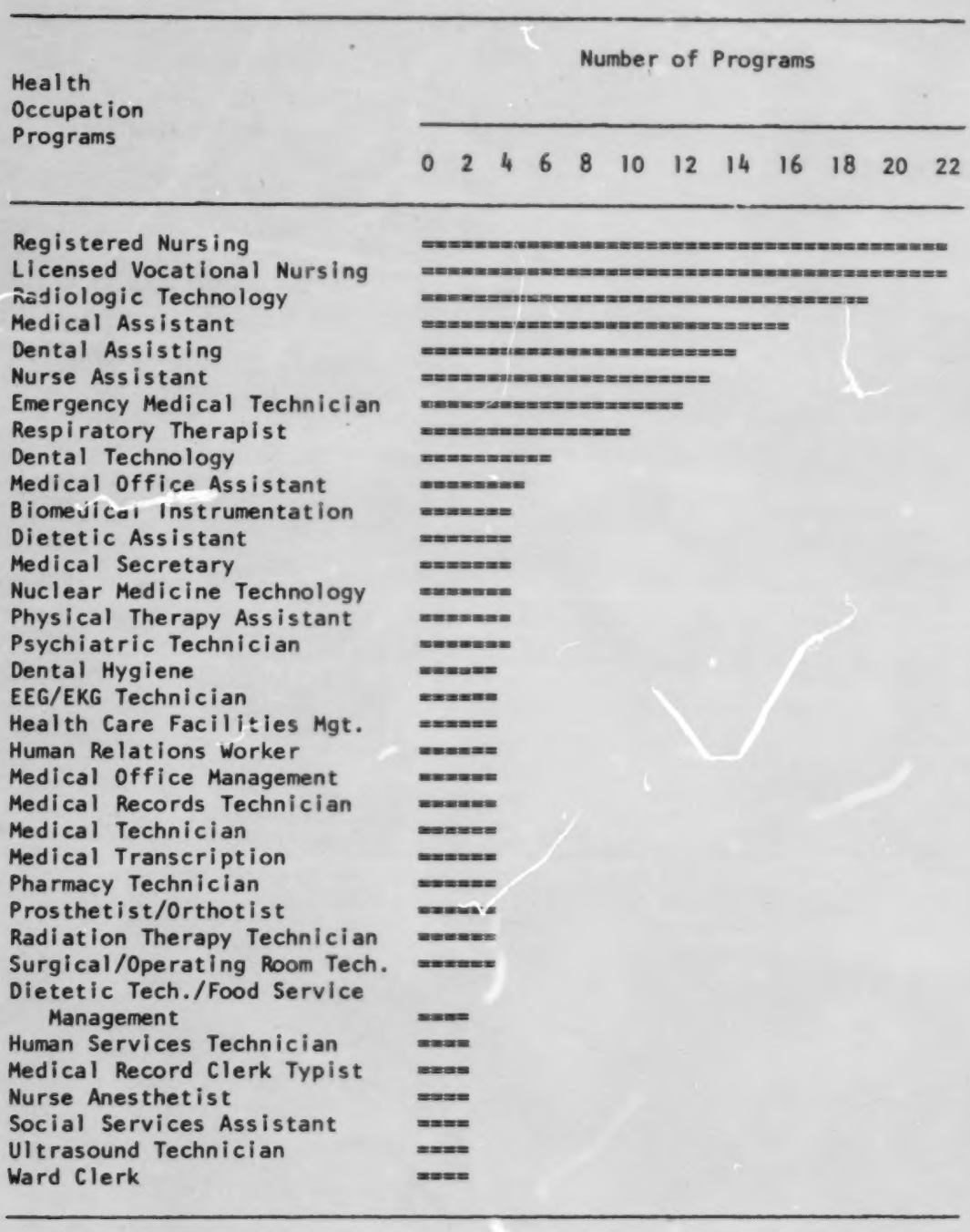
Registered and licensed degree nursing emphasis. Figure 1 (page 21) illustrates the relative frequency of nursing and other programs offered by area educational providers. The most frequent specific programs offered were registered and licensed degree nursing, each with 22 programs. Most of these are offered by community colleges (20 RN and 16 LVN programs).

Extensive technical programs. A variety of specific, often unique technical programs make up the largest number of programs offered within an occupational category. As indicated in Table 6, technical programs numbered 81, 36% of the total programs offered. The second largest group, assistants (20%), are often related to technician categories such as as dental, dietetic, and emergency medical technologies.

Variation by types of institutions. The variety of programs offered by educational providers generally follows hierarchical patterns; more intensive and specialized programs are typically offered by institutions granting higher degrees or certification levels. Four-year institutions and hospitals, for example, most often offer advanced technical, professional or nursing specialty programs. Proprietary programs emphasize office occupations, while adult or occupational schools most often provide training for semi-skilled occupations.

Figure 1

Histogram of the Number of Programs in Health Occupations Offered by Area Educational Institutions



Note: Fourteen additional programs were offered by a single institution responding to the survey. These are included in Table 6.

The major role of community college programs. Community colleges made up 26% of the sample, but reported 61% of all health occupation programs. As the summary of totals for Table 6 indicates, the proportion of programs offered by community colleges is substantially higher than 61% for registered and licensed vocational nursing (83% and 73%), and lower for technical, office, and semi-skilled occupations (56%, 35% and 42%). These data suggest that community colleges have a major responsibility for training nurses as well as for providing other types of related training, particularly in professional, technical, and assistant occupational categories. Survey results indicate that community colleges awarded more than 2,500 associate degrees in registered nursing during 1978-1980, more than half of all associate degrees awarded. In 1980 alone, the District awarded 534 nursing degrees.

THE ASSESSMENT OF CURRENT PROGRAMS

Purpose and Design

The purpose of the current program assessment was to measure the efficiency and quality of all approved District health occupation programs. Efficiency measures included comparisons of program size (duplicated enrollment and weekly student contact hours, or WSCH) and WSCH per FTE. The WSCH/FTE ratio provided the only cost indicator. Faculty loads used for analysis were set at 18 hours, the load for nursing programs established by contract negotiation for 1981-82. Enrollment, WSCH, FTE, and WSCH/FTE were recorded for each required course coded by the SAM system, in approved programs only. Data were collected for Fall 1977 and Fall 1979 and the change in WSCH computed. Data sources included first census D4600 WSCH by Subject printouts, the Directory of Courses and Programs, college catalogs and schedules, and response from college staff to inquiries concerning modularization or multiple laboratory per lecture section. These data are listed in Appendix B and summarized in Tables 7 (page 24) and 8 (page 26).

In spite of careful review and cross-referencing, several problems remain with enrollment and load data. In programs with less intensive vocational courses, including some C and D or E SAM codes, multiple sections of courses support a number of other programs, including those unrelated to health occupations, such as office administration, business, electronics, or family and consumer studies courses. Enrollment in these general courses was usually determined by applying the average enrollment and number of sections for specialized health occupation major courses (equal

Table 7

Duplicated Enrollment, WSCH, FTE, WSCH/FTE and Change in WSCH Fall 1977-79 in District Health Occupation Programs

College	SAM Code	F'77 Enroll.	F'77 WSCH	FTE	WSCH/ FTE	F'79 Enroll.	F'79 WSCH	FTE	WSCH/ FTE	77-79
City	A,B	625	5004	17.32	289	526	4883	16.19	302	- 02
	C	1612	7752	29.54	262	1403	6858	24.80	277	- 12
	D	481	1339	3.05	439	542	1401	2.81	499	+ 05
	Total	2718	14095	49.91	282	2471	13142	43.80	300	- 07
East	A,B	325	2640	9.62	274	349	2769	13.07	212	+ 05
	C	801	5043	19.26	262	727	4369	17.33	252	- 13
	D	380	1143	2.53	452	351	1012	2.36	429	- 11
	Total	1506	8826	31.41	281	1427	8150	32.76	249	- 08
Harbor	A,B	151	2360	11.39	207	224	2582	10.75	240	+ 09
	C	354	2864	8.00	358	340	2601	8.90	292	- 09
	D	64	192	.33	582	65	176	.44	400	- 08
	Total	569	5416	19.72	275	629	5359	20.09	267	- 01
Pierce	A,B	122	1995	10.89	183	183	1942	10.89	178	- 03
	C	476	2714	7.06	384	345	2462	5.95	414	- 09
	D	21	63	.17	371	29	208	.45	462	+ 230
	Total	619	4772	18.12	263	557	4612	17.29	267	- 03
Southwest	A,B	143	1723	11.65	148	102	1364	12.09	113	- 21
	C	140	1726	10.93	158	157	1583	8.94	177	- 08
	D	14	42	.17	247	13	39	.17	229	- 07
	Total	297	3491	22.75	153	272	2986	21.20	141	- 14
Trade	A,B	158	1529	6.83	224	152	1360	6.22	219	- 11
	C	695	5988	18.67	321	696	5585	16.46	314	- 07
	D	106	210	.45	467	100	205	.34	524	- 02
	Total	939	7727	25.95	298	948	7150	23.02	292	- 07

Table 7 (continued)

College	SAM Code	F'77 Enroll.	F'77 WSCH	FTE	WSCH/ FTE	F'79 Enroll.	F'79 WSCH	FTE	WSCH/ FTE	77-79
Valley	A,B	259	3854	15.29	252	216	3304	15.06	219	- 14
	C	593	4218	13.62	310	356	3872	15.09	257	- 08
	D	354	992	1.84	539	364	1098	2.52	436	+ 11
	Total	1206	9064	30.75	295	936	8274	32.67	253	- 09
West	A,B	169	863	1.90	454	142	466	1.34	348	- 46
	C	391	1746	6.64	263	697	2370	6.99	339	+ 36
	D	21	63	.17	371	95	437	.73	599	+ 594
	Total	581	2672	8.71	307	934	3273	9.06	361	+ 22
District	A,B	1932	19968	84.89	235	1894	18670	85.61	218	- 07
	C	5062	32051	113.72	282	4721	29700	104.46	280	- 07
	D	1441	4044	8.71	464	1559	4576	9.82	463	+ 13
	Total	8435	56063	207.32	270	8174	52946	199.89	263	- 06

Table 8

District Health Occupation Programs by Rank Order of Enrollment, WSCH, FTE, WSCH/FTE and Fall 1977-79 Change in WSCH

Health Occupation Programs	F'79 Enroll.		F'79 WSCH		F'79 FTE		F'79 WSCH/FTE		77-79 % Change	
	Number	Rank	Number	Rank	Number	Rank	Number	Rank	Number	Rank
Registered Nursing	1772	1	22466	1	110.12	1	204	26	- 04	13
Medical Office Asst.	910	2	3349	3	6.68	4	501	3	+ 16	8
Medical Secretary	740	3	2632	4	5.50	5	479	5	- 14	19
Lic. Voc. Nursing	673	4	6139	2	16.10	2	381	12	- 08	16
Dental Technology	406	5	1840	5	4.63	7	397	9	+ 17	7
Biomedical Technology	346	6	1731	7	4.26	9	406	8	- 35	26.5
Dietetic Technician/ Food Service Mgt.	337	7	1053	9	2.69	13	391	10	- 12	17.5
Dental Hygiene	324	8	1047	10	5.01	6	209	25	+ 18	6
Respiratory Therapy	309	9	1765	6	7.83	3	225	22	- 22	22
Dietetic Assistant	255	10	863	12	2.70	12	320	16	- 20	21
Dental Assistant	252	11	1170	8	3.96	10	295	18	- 23	23
Radiologic Technology	227	12	861	13	2.61	15	330	14	+ 07	10.5
Medical Assistant	219	13	683	16	.96	24	659	1	+ 24	5
Medical Record Tech.	189	14	782	15	2.95	11	265	20	- 35	26.5
Health Services Mgt.	144	15	444	21	.90	25	493	4	- 06	14
Cancer Program Mgt.	14[illegible]	16	418	22	1.30	21	322	15	- 15	20
Ophthalmic Optics	132	17	828	14	2.64	14	314	17	+ 51	4
Admins. Housekeeping	110	18	330	25	.85	26	388	11	- 24	24.5
Occup. Therapy Asst.	104	19	996	11	1.67	19	596	2	- 12	17.5
Surgical Technician	100	20	537	19	1.84	18	292	19	- 24	24.5
Prosthetics/Orthotics	83	21	508	20	2.38	17	213	24	+ 176	2
Phys. Therapy Asst.	75	22	404	23	1.22	23	331	13	+ 01	10.5
Emergency Dept. Asst.	72	23	372	24	.78	27	477	6	- 02	12
Psychiartric Technician	57	24	633	17	4.45	8	142	27	- 43	28
Nuclear Medical Tech	48	25.5	538	18	2.48	16	217	23	+ 460	1

Table 8 (continued)

Health Occupation Programs	F'79 Enroll.		F'79 WSCH		F'79 FTE		F'79 WSCH/FTE		77-79 % Change	
	Number	Rank	Number	Rank	Number	Rank	Number	Rank	Number	Rank
Nurse Aide	48	25.5	144	28	.34	28	424	7	- 64	29
Electron Micro. Tech.	43	27.5	216	26	1.27	22	170	29	+ 11	9
Vision Care Technician	43	27.5	208	27	1.60	20	130	28	+ 51	3
Community Care Facilities Management	13	29	39	29	.17	29	229	21	- 07	15
Total	8174		52946		199.89		263		- 06	

to or greater than the average enrollment). If no specialized health occupation courses were offered, the average enrollment in the course was used to represent one section of health occupation program enrollment. In some cases, such as Biomedical Engineering or Medical Office Assistant, enrollment figures represent a theoretical enrollment of health occupation students. There was no assurance that students actually intended to enroll in the health occupation program.

Quality measures were limited to grade distributions, grade point averages, and retention rates for health occupation programs. Data sources were the Fall 1979 D5130 grade distribution printout and the D4790 retention rate printout. Districtwide totals, presented in Tables 9 (page 29) and 10 (page 30), are less meaningful than program totals because of higher enrollment in general courses in some programs (Biomedical, Medical Office Assistance) than in others (Registered Nursing, Dental Technology).

Analysis also included comparisons of the program's WSCH size to current employment in the occupational category for which the program provides training as presented in Table 11 (page 31). Efficiency measures were further explored by averaging the rank among programs and occupational categories for WSCH size, growth, and faculty load and current employment, estimated shortages, and average starting salary. The averaging of ranks helps to reconcile the conflicting values of high manpower demand, for example, and low cost. This mode of analysis could be extended by applying selected weights to the different value measures. Table 11 presents the results of this initial analysis of value ranks.

Table 9

Grade Distribution and Retention Rates of District Health Occupation Programs

Health Occupation Programs	% A	% B	% C	% D	% I	% F	% CR	% NC	Retention Rates	GPA
Nuclear Medicine Technology	23	25	23	0	0	0	29	0	100.0	2.71
Dental Hygiene	37	51	11	0	0	0	0	0	98.7	3.25
Emergency Department Assistant	28	52	20	0	0	0	0	0	98.5	2.94
Registered Nursing	16	40	36	3	2	2	1	1	89.5	2.57
Licensed Vocational Nursing	11	36	43	7	0	4	0	0	86.6	2.43
Radiologic Technology	9	38	35	4	0	1	14	0	82.6	2.49
Dental Technology	36	35	25	4	0	0	0	0	82.5	3.00
Psychiatric Technician	21	36	34	6	0	3	0	0	81.7	2.99
Physical Therapy Assistant	28	36	10	1	1	0	23	0	77.5	3.39
Respiratory Therapy	22	31	29	5	9	3	0	0	76.4	2.46
Surgical Technician	13	33	50	4	0	0	0	0	76.0	2.55
Ophthalmic Optics	17	24	51	3	2	3	0	0	74.8	2.46
Cancer Program Management	14	44	21	4	9	9	0	0	74.3	2.32
Dietetic Assistant	28	26	31	3	5	2	0	4	74.0	2.56
Occupational Therapy Assistant	16	30	31	19	1	2	0	0	70.2	2.37
Dietetic Tech./Food Services Mgt.	25	35	27	10	2	0	0	0	69.9	2.70
Biomedical Eng./Equip. Tech.	26	26	31	8	3	3	0	2	67.3	2.84
Dental Assisting	28	26	31	3	5	2	0	0	67.0	2.29
Medical Office Assistant	25	30	27	10	5	3	0	0	64.3	2.53
Administrative Housekeeping	29	34	30	6	1	0	0	0	63.8	2.84
Vision Care Technician	21	28	33	15	1	2	0	0	61.3	2.48
Medical Secretary	25	29	30	12	2	2	0	0	60.8	2.59
Medical Record Technician	15	32	38	10	4	1	0	0	59.5	2.42
Prosthetics/Orthotics	24	28	34	6	6	2	0	0	56.7	2.53
Medical Assistant	15	26	40	16	1	1	0	0	54.4	2.35
Electronic Microscopy Tech.	15	45	10	0	30	0	0	0	50.0	3.07
Health Services Management	19	42	18	6	5	10	0	0	24.6	2.82
Total	21	33	31	8	3	2	1	1	79.16	2.59

Table 10

Grade Distribution and Retention Rates of Programs by Occupational Groups

Occupational Groups	% A	% B	% C	% D	% I	% F	% CR	% NC	Retention Rates	GPA
Registered Nursing	16	40	36	3	2	2	1	1	89.5	2.57
Non-Nursing Professional	29	40	24	2	3	2	0	0	82.0	3.20
Technical	24	31	31	7	3	2	6	1	65.0	2.70
Licensed Vocational Nursing	11	36	43	7	0	4	0	0	86.6	2.43
Office	25	30	28	11	3	2	1	0	62.8	2.66
Assistant	22	27	34	9	3	2	1	1	66.1	2.60
Semi-Skilled	29	34	30	6	1	0	0	0	63.8	2.84

Table II

Rank and Average Rank Comparisons of District Health Occupation Programs by Measures of Scale, Growth, Load, Job and Salary Potentials*

Health Occupation Programs	F'79 WSCH	Change 77-79 % WSCH	WSCH/ FTE	Currently Employed	Future Est. % Shortage	Average Starting Salary	Average Rank Overall
Registered Nursing	1	13	26	1	2	4	7.8
Lic. Voc. Nursing	2	16	12	2	6.5	14.2	8.8
Medical Office Asst.	3	8	3	9	18.5	18.5	10.0
Medical Secretary	4	19	5	7	12	14.2	10.2
Dental Technology	5	7	9	19.5	18.5	2.3	10.2
Radiologic Tech.	13	10.5	14	6	11	7	10.3
Nuclear Med. Tech.	18	1	23	15.5	3	5.5	11.0
Biomedical Tech.	7	26.5	8	17	6.5	5.5	11.8
Medical Assistant	16.5	5	1	23	NA	14.2	11.9
Diet. Tech./Food Services Mgt.	9	17.5	10	14	15	8	12.2
Ophthalmic Dispenser	14	4	17	18	NA	10.3	12.7
Respiratory Therapy	6	22	22	8	8	10.3	12.7
Health Services Mgt.	21	14	4	NA	NA	NA	13.0
Dental Hygiene	10	6	25	19.5	16.5	2.3	13.2
Occup. Therapy Asst.	11	17.5	2	21	13.5	18.5	12.9
Emergency Dept. Asst.	24	12	6	NA	NA	NA	14.0
Phys. Therapy Asst.	23	10.5	13	12	9.5	18.5	14.4
Dental Assistant	8	23	18	13	4	21	14.5
Prosthetics/Orthots.	20	2	24	24	NA	2.3	14.5
Medical Record Tech.	15	26.5	20	11	5	14.2	15.3
Psychiatric Tech.	16.5	28	27	5	9.5	10.3	16.1
Operating Room Tech.	19	24.5	19	10	13.5	14.2	16.7
Dietetic Assistant	12	21	16	15.5	16.5	18.5	16.8
Nurse Assistant	28	29	7	3	NA	NA	16.8
Vision Care Asst.	27	3	28	22	1	22.5	17.2
Housekeeper	25	24.5	11	4	20	22.5	17.8
Cancer Program Mgt.	22	20	15	NA	NA	NA	19.0
Elec. Mic. Tech.	26	9	29	NA	NA	NA	21.3
Com. Care Fac. Mgt.	29	15	21	NA	NA	NA	21.7

* See Tables 8 and 12 for specific measures.
** Average starting salaries were estimated from mid-points of median categories: see Appendix A.

Although success rates of graduates passing licensure examinations has not been studied systematically, rates for registered and licensed vocational nursing--two of the largest programs offered by the District--have been included in this report.

Results

The most important findings drawn from the assessment of current programs include the following:

1. The major training emphasis in District health occupation programs is directed toward registered nursing.

2. Total WSCH in health occupation programs declined six percent across 1977-79.

3. District health occupation programs are diverse but the majority are small and offered by a single college.

4. The more intensive vocational courses are more expensive.

5. The scale of programs, grouped by occupational categories, generally corresponds to manpower needs.

6. The value of programs vary by measures of both efficiency and manpower needs.

7. There are few meaningful differences among programs or colleges in grade achievement.

8. Success in passing RN and LVN licensure examinations varies among colleges.

9. Retention rates for health occupation programs are substantially above districtwide averages.

10. The availability of health occupation programs varies among colleges.

The emphasis on registered nursing. Forty-two percent of the WSCH generated by District health occupation programs is produced by registered nursing and an additional 12 percent is produced by licensed vocational nursing

programs. These percentages do not include enrollment in the new registered nursing program at West, begun in Spring 1979, nor enrollment in elective or continuing education courses. Fall 1979 WSCH generated by nursing programs was ten percent higher than the figures used for this study, which were limited to required courses with SAM designations (see Appendix B, and Tables 7 through 12).

The decline in health occupation WSCH. Total WSCH in District health occupation programs declined six percent across 1977-79; 18 of the 29 programs declined in WSCH. The greatest declines were in Nurse Aide, Psychiatric Technician, Medical Records Technician, Biomedical Technology, Administrative Housekeeping, Dental Assisting, Respiratory Therapy, and Dietetic Assistant; most of these programs are small. Registered nursing declined four percent and licensed vocational nursing seven percent. The only college to increase WSCH was West (+22%); Southwest declined 14 percent (see Appendix B and Table 7).

Although FTE instructors also declined four percent, this decline was less than that for total WSCH. Therefore the WSCH/FTE also dropped, from 270 to 263. Further erosion of WSCH/FTE was arrested by increasing WSCH in D level, less intensive courses which have a higher WSCH/FTE than do A-C level courses.

Reasons for these declines are not clear but may include Proposition 13 cutbacks, changes in student interest, differences in recruitment strategies, and/or changes in manpower demands. Certainly the decline in registered and licensed vocational nursing do not reflect less manpower demand, and is cause for concern.

The diversity of small health occupation programs. The 29 health occupation programs offered by the District represent a wide variety of fields. The great majority of these programs, two-thirds, generated less than 1000 WSCH each. Programs only offered by a single college make up 80% of all District health occupation programs. In contrast, Registered Nursing programs are now offered by eight of the nine campus colleges, Medical Office assistance programs are offered by four colleges, Medical Secretary programs by three, and Respiratory Therapy and Biomedical technology programs are each offered by two colleges. In Fall 1979 City had the highest number of programs at thirteen; East had nine, Trade five, Valley four, and Harobr, Pierce, Southwest and West each had three programs. Mission had no programs but offered some courses in health occupations (see Tables 7 and 8).

The offering of programs by just one college is intended to avoid unnecessary duplication and increase the efficiency of programs which serve discrete health occupation specialties with modest enrollment demand. However, the size of the District and the distance between some of the colleges and their service areas makes it necessary to look at regional needs for programs. Some high cost, high demand programs may need to be duplicated. Low cost programs with high employment potential, such as those in office occupations, can be offered by several colleges.

The higher cost of vocationally intensive courses. The breakdown of WSCH/FTE data by SAM priority slants indicates that costs increase with vocational intensity. While the Districtwide WSCH/FTE ratio was 464:1, A-B level courses had a ratio of 218:1, C level courses 280:1, and D level courses 463:1. The small clinical and work experience requirements of

advanced associate degree training contribute to these differences. Such experiences are necessary to effective training in many health occupations. To be sure, program costs are reduced by enrollment of students in required general education courses: anatomy courses have a ratio of 590:1, mathematics has a ratio of 518:1, social sciences 486:1, and English 390:1. Less intensive elective or continuing education enrollment bolster WSCH/FTE in health occupation disciplines, as well. But the point needs to be made that intensive technical and professional training, for which there is high manpower demand, will drive up costs per average daily attendance (ADA). Priorities among institutional objectives must be high enough for such training if the necessary resources are going to be available. Declining WSCH in health occupation programs suggest that such priorities have not been established.

The consistency between programs and employment needs. Table 12 (page 36) presents a comparison between the scale of District health occupation programs, measured in total WSCH, and the scale of manpower needs, measured in current employment and estimated shortages. Programs are grouped within occupational categories and ranked, as are specific occupational role designations. These data are an impressive indication that District program emphases are in tune with manpower needs. Registered nursing ranked first in WSCH, enrollment, and estimated shortage. Licensed vocational nursing ranked third in WSCH and second in employment and estimated shortage. Technical fields ranked second in WSCH, third in employment, and fourth in estimated shortage. Rank varied no more than one position across categories for office occupations (3-4), assistants (5), non-nursing professionals (6-7), and semi-skilled occupations (6-7) (see Summary by Occupational Groups, bottom of Table 12).

Table 12

WSCH in District Health Occupation Programs
Compared to Employment within Occupational Groups

Programs within Occupational Groups	Fall 79 WSCH			Current Employment			Estimated Shortage	
	Number	%	Rank	Number	%	Rank	%	Rank
Registered Nursing	22466	42	1	7782	34	1	80	2
Non-Nursing								
Respiratory Therapy	1765	3	6	445	2	13	58	8
Dental Hygiene	1047	2	10	33	< 1	24.5	22	18.5
Ophthalmic Dispenser	828	2	14	35	< 1	23	NA	--
Prosthetics/Orthot.	508	1	20	3	< 1	29	NA	--
Other				630	1	8	NA	--
Technical								
Dental Technology	1840	3	5	33	< 1	24.5	25	17
Biomedical Tech.	1731	3	7	74	< 1	22	62	6.5
Diet. Tech./Food Services Mgt.	1053	2	9	92	< 1	19	29	15.5
Radiologic Tech.	861	2	13	534	2	11	45	11
Medical Record Tech.	782	1	15	221	1	16	63	5
Psychiatric Tech.	633	1	16.5	564	3	9	50	9.5
Nuclear Med. Tech.	538	1	18	91	< 1	20.5	67	3
Surgical (Operating Room) Technician	537	1	19	268	1	15	36	13.5
Health Services Mgt.	444	1	21	NA	-	--	NA	--
Cancer Program Mgt.	418	1	22	(see Medical Record Technician)				
Electronic Microscopic Technician	216	1	26	NA	-	--	NA	--
Other				1533	6	4	NA	--
Licensed Voc. Nurse	6139	12	2	4352	19	2	62	6.5
Office Occupations								
Medical Office Asst.	3349	6	3	426	2	14	20	20
Medical Secretary	2632	5	4	460	2	12	44	12
Other				1834	8	3	NA	--
Assistants								
Dental Assistant	1170	2	8	93	< 1	18	65	4
Occup. Therapy Asstl	996	2	11	30	< 1	26	36	13.5
Dietetic Assistant	863	2	12	91	< 1	20.5	22	18.5
Medical Assistant	633	2	16.5	21	< 1	28	NA	--
Physical Therapy Assistant	404	1	23	109	< 1	17	50	9.5

Table 12 (continued)

Programs within Occupational Groups	Fall 79 WSCH			Current Employment			Estimated Shortage	
	Number	%	Rank	Number	%	Rank	%	Rank
Assistants (continued)								
Emergency Dept. Asst.	372	1	24	NA	-	--	NA	--
Vision Care Tech.	208	1	27	23	1	27	83	1
Nurse Aide/Nurse Asst.	144	1	28	926	4	5	NA	--
Other				541	2	10	NA	--
Semi-Skilled Workers				1410	6		29	15.5
Administrative Housekeeping	330	1	25	666	3	7	7	21
Community Care Facilities Management	39		29	NA	-	--	NA	--
Other				744	3	6	NA	--

Summary by Occupational Groups

Occupational Groups	Fall 79 WSCH			Current Employment			Estimated Shortage	
	Number	%	Rank	Number	%	Rank	%	Rank
Registered Nursing	22466	42	1	7782	34	1	80	1
Non-Nursing Professional	4148	8	6	1146	5	7	34	6
Technical	9053	17	2	3410	15	3	49	4
Licensed Voc. Nurse	6139	12	3	4352	19	2	62	2
Office Occupations	5981	11	4	2720	12	4	51	3
Assistants	4646	9	5	1834	8	5	40	5
Semi-Skilled Workers	369	1	7	1410	6	6	29	7

One interpretation of these results is that no changes need to be made. Acute manpower shortages in nursing, as well as employment opportunities in the technical, office, and assistance fields for which community college can offer training counter such an argument. Responsibility for program development also takes into account the significant role community colleges play in the preparation of students for entry into health occupations.

The relative value of programs. Table 11 also presents a means of assessing the overall relative value of programs by averaging the rank of values the program affords. Values include measures of scale (total WSCH), growth (change in WSCH), load (WSCH/FTE), current employment, estimated shortages, and average annual starting salaries of occupational programs and positions. While this analysis is tentative and can be modified to include other value measures or the weighting of these measures, results nevertheless correspond to an intuitive judgment of program value and response to employment needs.

Registered and licensed vocational nursing have the highest average rank, in spite of high cost (WSCH/FTE). Medical secretary and office assistance programs rank third and fourth, balancing program efficiency measures against less urgent manpower needs and benefits.

This form of analysis appears to improve upon the separate analysis of program efficiencies and manpower incentives for program development. More work needs to be done to verify and refine such procedures.

The homogeneity of grade achievement. There were few meaningful differences among programs or colleges in grade distribution or grade point average. Grade point averages ranged from 2.35 to 3.39 for programs, but differences followed no discernable pattern. Grades were not consistently related to retention rates. College GPA differences were even smaller than among programs, ranging from 2.32 to 2.99; again, no meaningful pattern could be discerned. Table 9 presents grade distributions and grade point averages for programs.

Students passing RN/LVN licensure exams vary by colleges. The percent of 1980 graduates passing RN exams on their first attempt ranged from 38% to 97%. The districtwide average was 74%, below the statewide average of 86%. Suburban colleges fared better than did central city colleges, suggesting that the entering preparation of the large number of minority students in central city colleges was less adequate than that for the predominately white students entering suburban college programs. Licensed vocational nursing board exams were more easily passed by students from both Trade (98%), a central city college, and Harbor (96%), a suburban college. These results pose two questions: How can less well prepared urban students, frequently from minority backgrounds, be more adequately prepared for registered nursing board exams? To what extent should LVN programs be integrated with RN programs to accommodate underprepared or underachieving students? The growing minority population in Los Angeles makes it increasingly important to train health care personnel with the variety of ethnic minority representation indicative of area population distribution.

High retention rates in health occupation programs. Retention rates for District health occupation programs averaged 70% compared to an average of 66% for all programs districtwide. Table 9 presents retention rates for all programs, and Table 10 summarizes these data by occupational category. As Table 10 illustrates, registered and licensed vocational nursing categories had the highest retention rates (90%; 87%), followed by non-nursing professions (82%). Semi-skilled and office occupation programs had the lowest rates (64%; 63%). The rigor of RN and LVN programs is further demonstrated by below-average GPA's.

Variation among colleges offering health occupation programs. Differences in the number of programs offered by colleges, discussed above, indicate that older, more centrally located colleges (City, East, Trade) offer more programs than do newer, more suburban colleges (West, Harbor, Mission). These differences were further analyzed by comparing the proportion of WSCH, generated by health occupation programs at each college, to the proportion of total District WSCH generated by each college. Using these indices, health occupation WSCH is overrepresented (above the average proportion of total WSCH) at City and East, but underrepresented at Pierce as well as at Mission, with no health occupation programs. These differences need to be considered in terms of new or expanded program development.

THE DELPHI SURVEY

Purpose and Design

The Delphi Survey was developed to solicit information about future needs in health occupations--emergent occupational needs--within the next five years.

The Delphi technique is a method which draws upon the opinion of experts. The initial questions are entirely open; our survey asked: What new health occupations are emerging? What kinds of skills do they require? The second "iteration" utilizes results from the first: How important are these health occupations that have been identified? Are there other occupations that are important that have been overlooked? Delphi used the "N heads are better than one" adage, but replaces direct face-to-face interaction with sequential questionnaires, administered individually and with guaranteed anonymity. Each successive questionnaire is then a refinement of the previous one, and the predictions of the group reach some closure. The technique allows all expert participants to express their opinions without the problems inherent in a group discussion.

The first and second iterations have been administered and analyzed. The rate of response from the 60 experts identified, some by Advisory Committee members and some by a consultant, was 43% for the second iteration. Appendix D provides detailed sampling and response rate information.

Results

Delphi Survey findings to date indicate the following:

1. A wide variety of specialized, emerging occupational fields have been identified.

2. The desirability of developing training programs for these emerging occupations is uncertain.

3. The most numerous and highest ratings were given to geriatric service occupations.

4. Occupational categories most often indicated were registered nursing and technicians.

The variety of specialized, emergent occupations. The initial questionnaire results identified 45 emergent occupations in 27 categories. Respondents of the second iteration rated 43 occupations, most of them suggested by the first iteration. Many of these suggestions, listed in Table 13 (page 43) were highly specialized. Examples include Coordinator for Hospital Emotional Care, Director of Play Therapy for Pediatrics, New Lifestyles Counselor, and College Instructor for Hospital Emotional Care. Other, perhaps less esoteric titles, are still highly specialized: Phlebotomy Technician, Radioimmunoassay Technician, Neonatal Intensive Care Practitioner, and Bilingual Gerontological Nurse.

The uncertainty of importance to educational program development. Second iteration respondents were asked to rate emergent occupations on a scale from 1 to 9, with 1 defined as highly unimportant, 3 defined as somewhat unimportant, 5 as don't know or no opinion, 7 as somewhat important, and 9 as highly important. Average ratings of occupations which had at least a two-thirds response ranged from 4.45 (don't know) to 7.41 (somewhat important). Eighteen of the 43 occupations (42%) were rated 6.5 or higher, or within the "somewhat important" level. Variation in ratings among respondents, however, was considerable.

Table 13

Future Needs for Educational Programs in the Health Occupations, in Rank Order of Average Ratings Assigned by Delphi Respondents

Health Occupational Programs	Rank	Average Rating	Number Responding
Gerontology Worker	1	7.41	22
Computer Technologist	2	7.35	23
Nursing Home Administrator	3	7.22	18
Bilingual Gerontological Nurse	4	7.18	22
Registered Nurse, Primary Care Spcl'ty	5	7.14	21
Gerontological Worker, Senior Centers	6	7.10	21
Emergency Medical Assistant	7	7.08	24
Hospice Spec'list for Terminally Ill	8	7.05	22
Emergency Medical Technician	9	7.05	25
Biomedical Equipment Repair Tech.	10	6.95	22
Home Health Aide for the Elderly	11	6.90	21
Medical Records Technician	12.5	6.86	22
Preventive Health Specialist	12.5	6.86	22
Physical Therapy Assistant	14	6.78	22
C. A. T. Technologist	15.5	6.64	22
Homemaker for the Elderly	15.5	6.64	22
Medical Library Technician	17	6.62	21
Community Health Worker	18	6.52	23
Nurse Practitioner	19	6.40	20
Clinical Nurse Manager	20	6.38	21
Registered Nurse, Geriatric Spcl'ty	21	6.35	20
Health Careers Counselor	22	6.26	23
Electrocardiographic Technician	23	6.16	25
Dental Chair Assistant	24	6.13	24
Neonatal Intensive Care Practitioner	25	6.10	21
Physician Assistant	26	5.91	22
Registered Nurse, Specialty in Care for the Dying	27	5.90	20
Coordinator for Emotional Care Provided in Hospitals	28	5.83	23
Dental Hygienist	29	5.79	24
Surgical Assistant	30	5.75	20
Medical Laboratory Technician	31	5.74	23
College Instructor, Hospital Emotional Care	32	5.73	22
Nurse Aide	33	5.67	21
Enterostomal Therapist	34	5.65	20
Hospital Central Supply Technician	35	5.64	25
Director of Play Therapy, Pediatrics	36	5.59	22
New Lifestyles Counselor	37	5.50	22
Histotechnologist	38	5.43	23
Coordinator of Nurse Retention	39	5.39	23
Biomedical Engineer	40	5.12	25
Phlebotomy Technician	41.5	4.96	23
Radioimmunoassy Technician	41.5	4.96	23
Pharmacy Technician	43	4.45	22

The importance of geriatric services. Perhaps the most important trend to surface from the Delphi Survey is the importance of training for the provision of geriatric services. As Table 13 indicates, occupations related to such services are the highest in number and average rank, at 9 occupations and 10.7 average rank (6.87 average rating, or somewhat important). Geriatric services range from management functions to direct patient care.

The importance of Registered Nursing and Technical Occupation. The long list of emergent occupations and their ratings presented in Table 13 is difficult to analyze and decipher. Table 14 (page 45) looks at these occupations in two ways, by occupational categories used for the Employer and Education Surveys, and by topical employment categories. Recognition of the importance of geriatric services grew from the latter analysis while that of registered nursing and technical roles became obvious in analyzing occupations from the former perspective. (Note that in both analyses, some occupations are listed in more than one category.)

Emergent occupations assigned to registered nursing and technical occupational categories each numbered 15, compared to 7 or less for the remaining 4 categories (there were no occupations specifically identified with licensed vocational nursing, the seventh category). The average rank among the 43 occupations was 19.4 for registered nursing (with an average rating of 6.36) and 24.9 for technical occupations (with a 5.97 average rating). While occupations in these categories were more numerous, overall ratings were no higher than for other categories. Five of the registered nursing occupations were rated somewhat important, and six of

Table 14

Future Needs for Educational Programs in Health Occupations, Grouped In Occupational and Topical Employment Categories

A. Occupational Categories

Occupational Categories	N	Rank	Occupational Categories	N	Rank
Registered Nursing	15	19.4	Non-Nursing Professional	7	19.4
Nursing Home Admin.		3	Nursing Home Admin.		3
Bilingual Geron. Nurse		4	Hospice Specialist		8
RN, Primary Care Spc'lty		5	Preventive Health Spc'lst		12
Hospice Specialist		8	Community Health Worker		18
Prev. Health Spc'list		12	Health Careers Counselor		22
Nurse Practitioner		19	Dir. Play Therapy, Pediac.		36
Clinical Nurse Manager		20	New Lifestyles Counselor		37
RN, Geriatric Spc'lty		21			
Health Careers Counselor		22	Semi-Skilled	5	13.2
Neonatal Int. Care Prac.		25			
Physician Ass't.		26	Gerontological Worker		1
RN, Sc. Care for Dying		27	Geront. Worker, Sr. Center		6
Coord., Hosp. Emot. Care		28	Home Health Aide for Elderly		11
Instruct., Emot. Care		32	Homemaker for Elderly		15
Coord. Nurse Retention		39	Nurse Aide		33
Technical	15	24.9	Assistants	5	16.2
Computer Technologist		2	Emergency Medical Asst.		7
Emerg. Med. Tech.		9	Physical Therapy Asst.		14
Biomed. Equip. Tech		10	Dental Chair Assistant		24
Med. Records Tech.		12	Physician Assistant		26
CAT Technologist		15	Surgical Assistant		30
Med. Library Tech.		17			
EKG Technician		23	Office	2	14.5
Med. Laboratory Tech.		31			
Enterostomal Therapist		34	Medical Records Technician		12
Hosp. Cen. Supply Tech.		35	Medical Library Technician		17
Histotechnologist		38			
Biomedical Engineer		40			
Phlebotomy Technician		41			
Radioimmunoassy Tech.		41			
Pharmacy Tech.		43			

Table 14 (continued)

B. Topical Employment Categories

Topics	N	Rank
Geriatric Services	9	10.7
Gerontology Worker		1
Nursing Home Administrator		3
Bilingual Geront. Worker		4
Geront. Worker, Sr. Center		6
Hospice Specialist		8
Home Health Aide for Elderly		11
Homemaker for Elderly		15
RN, Geriatric Specialist		21
RN, Spc. Care for Dying		27
Administration/Office Management	8	23.8
Nursing Home Administrator		3
Medical Records Tech.		12
Medical Library Tech.		17
Clinical Nurse Manager		20
Coord., Hospital Emot. Care		28
Hosp. Central Supply Tech.		35
Dir., Play Therapy, Ped.		36
Coord., Nurse Retention		39
Technical Instrument Operation and Maintenance	5	18.0
Computer Technology		2
Biomedical Equipment Rpr.		10
C. A. T. Technologist		15
EKG Technician		23
Biomedical Engineer		40
Health Education/ Social Services	5	24.2
Prev. Health Spcl'st		12
Community Health Worker		18
Health Careers Couns.		22
Instruct., Hosp. Emot. Care		32
New Lifestyles Couns.		37
Clinical Laboratory/ Pharmacy Services	5	38.8
Medical Lab. Tech.		31
Histotechnologist		38
Radioimmunoassay Tech.		41
Phlebotomy Tech.		41
Pharmacy Technician		43
Emergency/Intensive Care	4	11.0
RN, Primary Care Spc'lty		3
Emergency Medical Asst.		7
Emergency Medical Tech.		9
Neonatal Int. Care Prac.		25
Rehabilitation/Therapy	4	11.0
Phys. Therapy Asst.		14
Coord., Hosp. Emot. Care		28
Enterostomal Therapist		34
Dir., Play Therapy		36
General Patient Care	2	26.0
Nurse Practioner		19
Nurse Aide		33
Dental Services	2	26.5
Dental Chair Assistant		24
Dental Hygienist		29
Physician Extender	2	28.0
Physician Assistant		26
Surgical Assistant		30

the technical categories were so rated. The least numerous occupations were for semi-skilled, office, and assistance categories which are relatively less well paid and which rely heavily on adult and occupational schools for training. These results suggest that certain registered nursing specializations and technical occupations should be considered for community college development.

SUMMARY

Study results indicate the following general conclusions:

1. The demand for programs training registered nurses far exceeds any other need for health occupation personnel.

   High current employment, high estimated future shortages, and high entering salaries make registered nursing one of the most attractive health occupation fields for which community colleges offer training. In addition, most registered nursing training in the area is offered by community colleges, indicating a major segmental responsibility for area training.

2. The demand for programs related to registered nursing is extensive and includes variation in both level and type of specialization.

   High employment in nurse aid and licensed vocational nurse positions, coupled with a growing variety of specializations for registered nurses and the potential for advancement, suggests the need for close articulation with other area educational providers. Some program revision or new development within college curricula may be required to implement a fully comprehensive ladder system for nursing personnel.

3. The demand for programs training specialized technicians is substantial and appears to be growing.

   Employer Survey results indicate that current employment in technical occupations is second only to registered and licensed vocational nursing; salaries are relatively high. The Delphi Survey also indicated growth in technical areas. These occupations are often diverse and specific rather than general so that program development requires detailed planning. Frequent changes in job market demands may also require more rapid phasing in or out of programs than usual. Common subject areas include but are not limited to computer technology, medical records and instrumentation, and specific types of therapy.

4. There is a continuing demand for medical office personnel; training needs are not intensive.

   Although salary levels for office workers are typically modest, current and future employment appears sizable and stable. Training programs can be integrated with existing business, office administration, and allied health curricula. Training costs measured in WSCH/FTE are relatively low.

5. There is a limited demand for assistants; the potential for articulation with higher level certification needs to be considered.

   Current employment and salary levels vary among assistant positions, but the Employer Survey showed that assistants as a group are not

in short supply nor are they very well paid. Training for assistants could be integrated or articulated with programs leading to higher level certification, thereby providing ladder entry employment with the potential for upward mobility.

6. District health occupation programs are generally consistent with employment trends.

   Although enrollment and WSCH in District health occupation programs has slightly decreased overall, between Fall 1977 and Fall 1979, rank comparisons of program size (measured in WSCH) and current employment, both grouped into occupational categories, varied no more than one rank position in each category. Nursing and technicians ranked highest; non-nursing professionals and semi-skilled workers ranked lowest.

These general conclusions and other specific findings of the study will provide a basis for the development of a districtwide master plan for health occupations. Advisory Committee members will consider the feasibility of planning options formulated by OEPRD staff and recommend revisions or alternatives. These options will then be reviewed by appropriate administrative staff, altered as necessary, and finalized as a districtwide master plan for health occupations. This master plan will be in effect the second volume of the study of district health occupational program needs.

APPENDICES

Appendix A

Health Occupation Employment Opportunity and Salary Information in Rank Order of Median Annual Starting Salary within Major Occupational Groups

Occupational Groups (Average Annual Starting Salary)	Current # of Employees		Annual # of Openings		Median Annual Starting Salary	Annual Starting Salary in Thousands of Dollars (Percentage of Employees)															Personnel Supply (Percentage of Institutions Responding) Current			Future		
	Full-Time	Part-Time	Full-Time	Part-Time		% LT 9	% 9-10	% 10-11	% 11-12	% 12-13	% 13-14	% 14-15	% 15-16	% 16-17	% 17-18	% 18-19	% 19-20	% 20-25	% GE 25	% of Total	% Surplus	% Adequate	% Shortage	% Surplus	% Adequate	% Shortage
Registered Nursing																										
Reg. Nurse	5283	2333	812	272	18-19								1	10	38	24	23	3		92	1	18	81	3	17	80
Specialty Reg. Nurse	148	18	30	1	16-17								35	23	35			7		97		33	67		33	67
Non-Nursing Professionals																										
Industrial Hygienist or Director of Environ. Services	5				20-25													50	50	100						
Health Care Assistant Administrator	133	1	12		20-25			7	5	5	2	12	4	4	4	1	4	27	26	61	18	71	10	21	61	18
Long-Term Care Administrator	46	2	2		20-25					6		3		9	3	6		27	46	69		88	12		87	13
Dental Hygienist	18	15	2		20-25						12							65	24	52		88	12		78	22
Pharmacist	7				20-25													100		100						
Orthotist or Prosthetist	3				20-25													100		100						
Public Health Microbiologist	1				20-25													100		100						
Public Health Practitioner	19	5	3	2	19-20					17					12		71					100			100	
Physicians' Asst. Primary Care	19	18	812	1	18-19						5		27			46		23		100		75	25		75	25
Registered Sanitarian	15				18-19											100				100						
Opthalmic Optician	10	1	1		18-19	9	9							9		27	18	18		100	25	50	25	33	67	
Health Educator	23	1	4		17-18						2	27	9		45	9				46	14	14	71	17		83
Occupational Therapist	3	2			17-18									40	40	20				100						
Dietician/ Nutritionist	16				15-16								60	13	7	13		7		94						
Rehabilitation Counselor	133	11	11	3	14-15	12	1	19	1	3	3	28	23		3	8		2		83	19	56	25	23	39	39
Alcohol/Drug Abuse Specialist	71	17	14	2	14-15			5	4	21	5	21		8	13	12	3		7	85		92	8	10	80	10
Respiratory Therapist	381	64	74	13	13-14			3	17	22	34	25								85		50	50		42	58
Opthalmic Dispenser	30	5			13-14						100									100						
Community Health Worker	70	8	5	1	11-12			1	51	9	3	4	4		19	7	1			90	29	71		13	87	
Other Info-Communication (Librarian, Tech., Worker)	8				5-10		100													75						

Occupational Groups (Average Annual Starting Salary)	Current # of Employees		Annual # of Openings		Median Annual Starting Salary	Annual Starting Salary in Thousands of Dollars (Percentage of Employees														Personnel Supply (Percentage of Institutions Responding) Current			Future		
	Full-Time	Part-Time	Full-Time	Part-Time		% LT 9	% 9-10	% 10-11	% 11-12	% 12-13	% 13-14	% 14-15	% 15-16	% 16-17	% 17-18	% 18-19	% 19-20	% 20-25	% GE 25	% of Total	% Surplus	% Adequate	% Shortage	% Surplus	% Adequate	% Shortage
Assistants																									
Lab Assistant	228	138	38	11	12-13	3	4	23	15	47	1					1	6			78	17	48	35	12	50	38
Medical Library Asst.	14	7	1		12-13		6	17	11	39	6	6		6	11					86		100			100	
Dietetic Asst.	86	5	12		11-12	3	31	2	15	8		20			14	7				65	7	78	15	8	70	22
Physical Therapy Asst.	83	26	20	9	11-12		21	14	34	14	10			1	5					91	5	74	21	6	44	50
Occ. Therapy Asst.	24	6	7	2	11-12		4	16	32	12	8	4	4	4	8					83	5	71	29		64	36
Env. Engin. Asst.	14				11-12			14	57	14				7		7				100		80	20		50	50
Mental Health Asst. Worker	121	16	12	3	10-11		30	37				33								88	25	50	25	25	50	25
Dental Asst.	86	7	24	3	10-11	13	24	26	1	28	7			1						94		63	37		35	65
Other Physical Therapy (Aide, Tech., Therapist	19	5	1		10-11		44	30						4	4											
Optometric Asst.	15	8	6	1	9-10	22	50	22	6								9	9		96			100			100
Nursing Asst.	830	96	55	28	LT 9	77	23													82		43	57		17	83
																				78						
Semi-Skilled																										
Cook	9				10-11			100												100						
Health Care Facilities Housekeeper	588	78	33	26	9-10	43	35	3	11	2		5						1		65	17	73	10	15	78	7
Homemaker/Home Health Aide	133	12	48	11	9-10	25	44	22	9											98	8	17	75		33	67
Child Care Worker	6				9-10		100													100						
Geriatric Care Worker	296	53	113	27	LT 9	65	35													91		33	67		33	67
Food Service Worker	84	50			LT 9	100														84						
Housekeeper Aides	46	5			LT 9	100														59						
Mental Retardation Aide	50																									

Occupational Groups (Average Annual Starting Salary)	Current # of Employees		Annual # of Openings		Median Annual Starting Salary	Annual Starting Salary in Thousands of Dollars (Percentage of Employees															Personnel Supply (Percentage of Institutions Responding) Current			Future		
	Full-Time	Part-Time	Full-Time	Part-Time		% LT 9	% 9-10	% 10-11	% 11-12	% 12-13	% 13-14	% 14-15	% 15-16	% 16-17	% 17-18	% 18-19	% 19-20	% 20-25	% GE 25	% of Total	% Surplus	% Adequate	% Shortage	% Surplus	% Adequate	% Shortage
Technicians																										
Other Medical Instrumentation (Tech.)	3				20-25													100		33						
Lab Tech.	299	57	31	15	18-19	1		6	10			1	1	5	0	46	4	25	1	83	5	53	42		47	53
Nuclear Medicine Tech.	85	6	13		17-18					1	2		5	36	41	14	1			96	4	29	67	4	29	67
Cytotechnologist	75	16	14		17-18							14	10	17	17	41				32		86	14		50	50
Biomedical Engin. Tech.	71	3	8		17-18					2	2	2	14	12	29	10		22	6	66		47	53		36	62
Radiation Therapy Tech.	54	10	8	1	16-17								42	19	33	4		2		75		62	38		42	58
Opthalmic Lab. Tech.	5		1	1	16-17					20				40	40					100	100			100		
Radiologic Tech.	472	62	75	19	15-16		0		7	1		20	48	10	13	1				90	3	56	41	3	52	45
Histologic Tech.	65	6	7	2	15-16			4		6	3	6	54	1	9	17				97	8	62	31	10	60	30
Orthopedic Tech.	39	1	3		15-16				5	31			64							98			100			100
Cardiopulmonary Tech.	88	12	17	9	14-15		6	3	5	7	15	36	23				2	1	2	87	10	70	20	12	59	29
Dietetic Tech.	87	5	10	1	14-15			6	20	13	6	26	1	14	1	10		1	1	76		81	19		71	29
Psychiatric Tech.	557	7	22	1	13-14			0	1	4	95									96		50	50		50	50
Operating Room Tech.	244	24	31	5	12-13	0	10	1	34	34	20		0		0					88	8	71	21	9	55	36
Medical Records Tech.	201	20	37	5	12-13	3	2	14	15	38	19	1	1	1	1	1	1	1		79	4	50	46	2	35	63
Respiratory Therapy Tech.	194	56	52	31	12-13				12	54	14	21								90		63	37		35	65
Emergency Medical Tech	47	15	4	15	12-13		7	23	5	37	9		7			12				69	14	86			100	
Pharmacy Tech.	260	94	42	26	11-12	1	5	5	34	35	19								1	94	4	69	27	4	44	52
Electroencephalographic Tech.	57	18	7	7	12-13		13	12	34	16	1	10	3	10						91	5	65	30	5	47	47
Human Services Tech.	58	4	8		10-11			81									11	8		100	33		67	33		67
Dental Tech.	18	15	2		20-25						12							65	24	52		88	13	10	70	20
Nursing - LVN																										
LVN	3222	1130	371	184	12-13				6	56	31	4	1	1	1					96	4	44	52	5	33	62
Office Staff																										
Medical Secretary	409	51	25	8	12-13	1	2	3	33	33	11	16		1						94	2	57	41		56	44
Medical Transcrip.	285	86	61	26	12-13		3	2	16	32	25	16	4		2	1				94	2	23	75	5	14	81
Dental Secretary	30	2	1	1	12-13			17	10	69	4									91		58	42		27	73
Medical Office Asst.	303	123	31	5	11-12	5	23	6	59	4	1	2		1						86	4	79	17	5	75	20
Unit Clerk	1114	317	174	56	10-11	2	18	43	13	21	3									89	8	67	25	6	57	37

Appendix B

Duplicated Enrollment, WSCH, WSCH/FTE, and Change in WSCH Fall 1977-79 of District Health Occupation Program by College, in Rank Order of Highest Fall 1979 Program Enrollment

Program	College	SAM Code	F'77 Enroll	F'77 WSCH	FTE	WSCH/ FTE	F'79 Enroll	F'79 WSCH	FTE	WSCH/ FTE	% Change F'77-F'79
Registered Nursing	City	A,B	93	1778	8.50	209	116	2179	9.36	233	+ 23
		C	52	1132	9.74	116	63	546	6.07	90	- 52
		Total	145	2910	18.24	160	179	2725	15.43	177	- 6
	East	A,B	43	817	4.22	194	103	1309	7.45	176	+ 60
		C	185	2747	12.24	224	136	2264	9.80	231	- 18
		Total	228	3564	16.46	217	239	3573	17.25	207	0
	Harbor	A,B	71	1554	9.56	163	134	1712	8.64	198	+ 10
		C	98	784	4.00	196	97	776	4.00	194	- 1
		D	64	192	.33	582	46	138	.33	418	- 28
		Total	233	2534	13.89	182	277	2626	12.97	202	- 4
	Pierce	A,B	83	1826	10.44	175	79	1738	10.44	166	- 5
		C	136	1373	3.89	353	131	1449	3.73	388	+ 6
		Total	219	3199	14.33	223	210	3187	14.17	225	0
	Southwest	A,B	143	1723	11.65	148	98	1332	11.65	114	- 23
		C	111	1542	9.17	168	78	1107	7.00	158	- 28
		Total	254	3265	20.82	157	176	2439	18.65	131	- 25
	Trade	A,B	33	330	2.00	165	64	512	2.33	220	+ 55
		C	154	1293	4.78	271	171	1368	3.67	373	+ 6
		D	62	122	.23	530	73	151	.23	657	+ 24
		Total	249	1745	7.01	249	308	2031	6.23	326	+ 16
	Valley	A,B	165	3218	13.00	248	144	2808	13.00	216	- 13
		C	133	2594	9.75	266	143	2789	11.92	234	+ 8
		D	99	297	.33	900	96	288	.50	576	- 3
		Total	397	6109	23.08	265	383	5885	25.42	232	- 4
	District	A,B	631	11250	59.37	189	738	11590	62.87	184	+ 3
		C	869	11465	53.57	214	819	10299	46.19	223	- 10
		D	225	611	.89	687	215	577	1.06	544	- 6
		Total	1725	23326	113.83	205	1772	22466	110.12	204	- 4
Medical Office Assistant/ Medical Office Admin. Assistant	City	A,B	52	208	.45	462	58	232	.45	516	+ 12
		C	181	607	1.35	450	173	592	1.18	502	- 2
		Total	233	815	1.80	453	231	824	1.63	506	+ 1
	Harbor	A,B					19	95	.28	339	--
		C	75	324	.67	484	76	266	.79	337	- 18
		D					19	38	.11	345	--
		Total	75	324	.67	484	114	399	1.18	338	+ 23
	Pierce	A,B	39	169	.45	376	50	204	.45	453	+ 21
		C	287	1004	2.12	474	193	672	1.17	574	- 33
		D					29	145	.28	518	--
		Total	326	1173	2.57	456	272	1021	1.90	537	- 13
	West	A,B	34	136	.45	302	46	178	.45	396	+ 31
		C	136	442	1.46	303	209	737	1.24	594	+ 67
		D					38	190	.28	679	--
		Total	170	578	1.91	303	293	1105	1.97	561	+ 91

Program	College	SAM Code	F'77 Enroll	F'77 WSCH	FTE	WSCH/ FTE	F'79 Enroll	F'79 WSCH	FTE	WSCH/ FTE	% Change F'77-F'79
	District	A,B	125	513	1.35	380	173	709	1.63	435	+ 38
		C	679	2377	5.60	424	651	2267	4.38	518	- 5
		D					86	373	.67	557	--
		Total	804	2890	6.95	416	910	3349	6.68	501	+ 16
Medical Secretary	City	A,B	104	468	1.01	463	52	208	.45	462	- 56
		C	233	867	1.91	454	203	679	1.51	450	- 22
		Total	337	1335	2.92	457	255	887	1.96	453	- 34
	East	A,B	85	381	1.01	377	96	432	1.01	428	+ 13
		C	66	154	.39	395	72	192	.45	427	+ 25
		Total	151	535	1.40	382	168	624	1.46	427	+ 17
	West	A,B	71	553	1.01	548	36	128	.45	284	- 77
		C	153	652	1.40	466	243	803	1.35	595	+ 23
		D					38	190	.28	679	
		Total	224	1205	2.41	500	317	1121	2.08	539	- 7
	District	A,B	260	1402	3.03	463	184	768	1.91	402	- 83
		C	452	1673	3.70	452	518	1674	3.31	506	--
		D					38	190	.28	679	
		Total	712	3075	6.73	457	740	2632	5.50	479	- 14
Licensed Vocational Nursing	Harbor	A,B	80	802	1.83	438	71	775	1.83	423	- 3
		C	181	1756	3.33	527	167	1559	4.11	379	- 11
		Total	261	2558	5.16	496	238	2334	5.94	393	- 9
	Trade	A,B	88	791	2.50	316	72	648	2.50	259	- 18
		C	381	3291	8.66	380	363	3157	7.66	412	- 4
		Total	469	4082	11.16	366	435	3805	10.16	375	- 7
	District	A,B	168	1593	4.33	368	143	1423	4.33	329	- 11
		C	562	5047	11.99	421	530	4716	11.77	401	- 7
		Total	730	6640	16.32	407	673	6139	16.10	381	- 8
Dental Technology	West	A,B	142	824	2.87	287	158	960	2.65	362	+ 17
		C	130	593	1.82	326	154	692	1.76	393	+ 17
		D	78	156	.22	709	94	188	.22	854	+ 21
		Total	350	1573	4.91	320	406	1840	4.63	397	+ 17
Biomedical Electronics Technology/Biomedical Equipment Technology	City	A,B	35	261	.88	297					
		C	246	1262	2.31	546	147	882	1.65	535	- 30
		Total	281	1523	3.19	477	147	882	1.65	535	- 42
	Valley	A,B	18	54	.17	318	12	36	.17	212	- 33
		C	342	1050	2.42	434	151	669	2.00	335	- 36
		D	24	48	.11	436	36	144	.44	327	+ 200
		Total	384	1152	2.70	427	199	849	2.61	325	- .26

Program	College	SAM Code	F'77 Enroll	F'77 WSCH	FTE	WSCH/ FTE	F'79 Enroll	F'79 WSCH	FTE	WSCH/ FTE	% Change F'77-F'79
	District	A,B	53	315	1.05	300	12	36	.17	212	- 89
		C	588	2312	4.73	489	298	1551	3.65	425	- 33
		D	24	48	.11	436	36	144	.44	327	+ 200
		Total	665	2675	5.89	454	346	1731	4.26	406	- 35
Dietetic Technician/ Food Service Mgmt.	City	A,B	42	210	1.11	189	10	50	.28	179	- 76
		C	92	276	.85	325	110	352	1.07	329	+ 28
		D	219	707	1.79	395	217	651	1.34	486	- 8
		Total	353	1193	3.75	318	337	1053	2.69	391	- 12
Dental Hygiene	West	A,B	64	174	.44	395	60	160	.44	364	- 8
		C	102	652	3.78	172	245	830	4.40	189	+ 27
		D	21	63	.17	371	19	57	.17	335	- 10
		Total	187	889	4.39	203	324	1047	5.01	209	+ 18
Respiratory Therapy	East	A,B	82	708	2.55	278	52	418	2.33	179	- 41
		C	95	692	2.94	235	73	533	3.28	163	- 23
		D	90	132	.28	471	85	137	.28	489	- 4
		Total	267	1532	5.77	266	210	1088	5.89	185	- 29
	Valley	A,B	48	386	.95	406	38	350	1.05	333	- 9
		C	20	280	.78	359	19	285	.83	343	+ 2
		D	54	54	.06	900	42	42	.06	700	- 22
		Total	122	720	1.79	402	99	677	1.94	349	- 6
	District	A,B	130	1094	3.50	313	90	768	3.38	227	- 30
		C	115	972	3.72	261	92	818	4.11	199	- 16
		D	144	186	.34	547	127	179	.34	526	- 4
		Total	389	2252	7.56	298	309	1765	7.83	225	- 22
Dietetic Assistant	Valley	A,B	28	196	1.17	168	22	110	.84	131	- 44
		C	98	294	.67	439	43	129	.34	379	- 56
		D	177	593	1.34	443	190	624	1.52	411	+ 5
		Total	303	1083	3.18	341	255	863	2.70	320	- 20
Dental Assistant	City	A,B	52	312	1.00	312	64	384	1.67	230	+ 23
		C	275	1162	3.84	303	158	756	2.23	339	- 35
		D	38	38	.06	633	30	30	.06	500	- 21
		Total	365	1512	4.90	309	252	1170	3.96	295	- 23
Radiologic Technology	City	A,B	57	170	.55	309	50	150	.55	273	- 12
		C	146	634	2.00	317	106	569	1.84	309	- 10
		D					71	142	.22	645	--
		Total	203	804	2.55	315	227	861	2.61	330	+ 7

Program	College	SAM Code	F'77 Enroll	F'77 WSCH	FTE	WSCH/ FTE	F'79 Enroll	F'79 WSCH	FTE	WSCH/ FTE	% Change F'77-F'79
Medical Assistant	East	A,B									
		C	106	296	.62	477	150	426	.62	687	+ 44
		D	72	216	.34	635	69	207	.34	609	- 4
		Total	178	512	.96	533	219	633	.96	659	+ 24
Medical Record Technician	East	A,B	40	260	.73	356	26	148	.73	203	- 43
		C	162	600	1.72	349	113	432	1.55	279	- 28
		D	81	344	.95	362	50	202	.67	301	- 41
		Total	283	1204	3.40	354	189	782	2.95	265	- 35
Health Services Management	East	C	81	221	.45	491	80	216	.45	480	- 2
		D	52	196	.45	435	64	228	.45	507	- 16
		Total	133	417	.90	463	144	444	.90	493	- 6
Cancer Program Management	East	C	78	234	.51	459	60	180	.68	265	- 23
		D	85	255	.51	500	83	238	.62	384	- 7
		Total	163	489	1.02	479	143	418	1.30	322	- 15
Ophthalmic Optics	City	C	76	550	2.51	219	101	735	2.51	293	+ 34
		D	28	84	.14	600	31	93	.13	715	+ 11
		Total	104	634	2.65	239	132	828	2.64	314	+ 31
Administrative Housekeeping	City	C	72	216	.51	424	44	132	.34	388	- 39
		D	72	216	.51	424	66	198	.51	388	- 8
		Total	144	432	1.02	424	110	330	.85	388	- 24
Occupational Therapy	City	A,B	48	773	.95	814	18	720	.78	923	- 7
		C	64	219	.78	281	53	177	.56	316	- 19
		D	46	138	.33	418	33	99	.33	300	- 28
		Total	158	1130	2.06	549	104	996	1.67	596	- 12
Surgical Technician	Trade	C	96	645	1.73	373	73	483	1.73	279	- 25
		D	33	66	.11	600	27	54	.11	491	- 18
		Total	129	711	1.84	386	100	537	1.84	292	- 24
Prosthetics/Orthotics	Southwest	A,B					4	32	.44	73	--
		C	29	184	1.76	105	79	476	1.94	245	+ 159
		Total	29	184	1.76	105	83	508	2.38	213	+ 176
Physical Therapy Assistant	Pierce	C	53	337	1.05	321	54	341	1.05	325	+ 1
		D	21	63	.17	371	21	63	.17	371	--
		Total	74	400	1.22	328	75	404	1.22	331	+ 1

Program	College	SAM Code	F'77 Enroll	F'77 WSCH	FTE	WSCH/ FTE	F'79 Enroll	F'79 WSCH	FTE	WSCH/ FTE	% Change F'77-F'79
Emergency Department Assistant	East	A,B	63	378	.67	564	57	342	.67	510	- 10
		C					15	30	.11	273	--
		Total	63	378	.67	564	72	372	.78	477	- 2
Psychiatric Technician	Trade	A,B	17	408	2.33	175	16	200	1.39	144	- 51
		C	42	693	3.16	219	41	433	3.06	142	- 38
		Total	59	1101	5.49	201	57	633	4.45	142	- 43
Nuclear Medicine Technology	City	C	16	96	.33	291	48	538	2.48	217	+ 460
Nurse Aide	Trade	C	22	66	.34	194	48	144	.34	424	- 118
		D	11	22	.11	200					
		Total	33	88	.45	196	48	144	.34	424	- 64
Electron Microscopy	East	A,B	12	96	.44	218	15	120	.88	136	+ 25
		C	28	99	.39	254	28	96	.39	246	- 3
		Total	40	195	.83	235	43	216	1.27	170	+ 11
Vision Care Technician	City	C	29	138	1.59	87	43	208	1.60	130	+ 51
Community Care Facilities Management	Southwest	D	14	42	.17	247	13	39	.17	229	- 7
Human Services, Option [1]	Harbor			(all academic courses)							

Note: Enrollment and Weekly Student Contact Hours (WSCH) are taken from the WSCH by Subject printout (04600) for Fall 1977 and Fall 1979. Both Enrollment and WSCH are only for those courses required of the program and offered during the term. The Student Accountability Model (SAM) priority codes indicate the degree of vocational preparation in the course. Full-time equivalent faculty (FTE) were derived from class section and instructor information in the WSCH by Subject printout, class schedules, and information from college departmental staff. Enrollment in courses serving additional programs was estimated using average enrollment in specialty major courses where available, or one section of average enrollment in such support courses if no specialty courses were offered. The ratio of WSCH to FTE was based on an 18 hour load for the sake of consistency, even though load levels varied among colleges and by discipline taught.

Appendix C

OCCUPATION DESCRIPTIONS

The occupations included in the surveys are those for which a postsecondary program of two years or less would be appropriate. These include degree, diploma, and certificate programs.

Descriptions are taken from both the American Society of Allied Health Professions 1975 Inventory of Health Occupations Educations and the Department of Labor's Dictionary of Occupational Titles.

ADMINISTRATION, PLANNING AND OFFICE personnel function at various levels to maintain and operate clinical offices and institutions and to plan for improved health care and delivery.

Health Care Assistant Administrator: Occupies middle management positions in a variety of clinical and health care facilities, social service agencies.

Long-Term Care Administrator: Directs and coordinates all operations and activities of extended care facilities.

Medical Secretary: Assists physicians through the use of medical shorthand, typing, filing, accounting, appointment scheduling, receptionist duties, and office management.

Medical Office Assistant: Assumes responsibility for routine administrative. clerical, and record-keeping procedures in a physician's office, assists the physician in medical examinations and treatments, and cares for medical equipment and supplies.

Unit Clerk: Handles routine clerical and reception work in a floor nursing unit: receiving patients and visitors, scheduling appointments, monitoring the location of all ward staff, and, where hospital policy permits, transcribing doctors' orders, ordering supplies and updating information on patients' charts. (Ward Clerk)

BIOMEDICAL ENGINEERING personnel combine basic engineering and biomedical science in order to design, assemble, and adapt medical devices, instruments, and processes to improve the quality and cost in the delivery of medical health care.

Biomedical Engineering Technician: Assembles, repairs, and adapts medical equipment to assist biomedical engineers, physicians and scientists in the development and maintenance of medical equipment and systems for the delivery of medical and health care.

CLINICAL LABORATORY SERVICES personnel work in a clinical laboratory setting, collecting, mounting, processing, classifying and analyzing laboratory specimens.

Cytotechnologist: Works under the supervision of a pathologist, physician, or medical technologist in handling, staining, mounting, and evaluating cells from the human body to determine cellular variations and abnormalities such as cancer and other physiologic changes.

Histologic Technician: Works under supervision of a pathologist or other qualified physician in sectioning, staining, and mounting human or animal tissues and fluid for microscopic study.

Laboratory Assistant: Works under the direct supervision of a medical technologist, pathologist, physician, or qualified scientist in performing routine laboratory procedures requiring basic technical skills and minimal independent judgment, in chemistry, hematology, and microbiology. (Certified Laboratory Assistant)

Laboratory Technician: Works under the supervision of a medical technologist, pathologist, or physician in performing more complex or specialized bacteriological, biological, and chemical tests requiring limited, independent judgment or correlation competency, to provide data for use in the diagnosis and evaluation of effective treatment of disease. (Blood Bank Technician, Cytotechnician, Hemotology Technician, Serology Technician)

DENTAL SERVICES personnel render varieties of services to the dentist; they do general office work, laboratory work, and they assist the dentist at the chairside.

Dental Assistant: Assists dentist at the chairside in dental operatory, performs reception and clerical functions, and carries out dental radiography and selected dental laboratory work. (Registered Dental Assistant)

Dental Hygienists: Are professional oral health clinicians and educators who help the public develop and maintain optimum oral health. As members of the dental health team, dental hygienists perform preventive, restorative, and therapeutic services under the supervision of a dentist. Dental hygienists are the only licensed dental auxiliary and specific responsibilities vary, depending on the state dental practice act.

Dental Secretary: Assists dentist through the use of medical shorthand, typing, filing, accounting, appointment scheduling, receptionist duties, and office management.

Dental Technician: Is prepared to construct complete and partial dentures, make orthodontic appliances, fix bridgework, crowns, and other dental restorations and appliances, as authorized by dentists. (Dental Laboratory Technician, Certified Dental Technician).

DIETETIC AND NUTRITION SERVICES personnel translate nutritional needs into the selection, purchasing, preparation, and service of appropriate foods, along with maintenance of equipment, sanitation, and cost control. They provide nutritional education to individuals and groups and serve as nutritional consultants to health facilities and communities.

Dietetic Technician: Functions as middle management and service personnel in the nutritional care of individuals in health care facilities, assisting with the planning, implementation, and evaluation of food programs, working with both the food service supervisor and the dietitian and, where hospital policy permits, may train and supervise dietary aides. (Food Service Manager, Food Service Assistant, Food Service Technician)

Dietetic Assistant: Writes food menus following dietetic specifications, coordinates food service to patients, orders supplies, maintains sanitation, and oversees the work of food service employees in health care facilities. (Food Service Supervisor)

EMERGENCY SERVICES personnel administer temporary medical help by responding to, evaluating, and assisting in emergency conditions.

Ambulance Attendant: Provides first aid and assistance in the transportation of critically ill and injured persons. (Emergency Dept. Assistant)

Emergency Medical Technician: Responds to medical emergency calls, evaluates the nature of the emergency, and carries out specified diagnostic and emergency treatment procedures under standing orders or the specific directions of a physician.

ENVIRONMENTAL SERVICES personnel inspect, evaluate, and gather date for their use in the design, operation, and control of systems for prevention and elimination of environmental hazards.

Environmental Engineering Assistant: Works with and assists the environmental engineer in his tasks of designing and controlling systems to eliminate and control environmental health hazards.

Environmental Health Technician: Assists in the survey of environmental hazards and performs technical duties under professional supervision in many areas of environmental health such as pollution control, radiation protection, and sanitation protection. (Sanitarian Technician)

Health Care Facilities Housekeeper: Develops, implements, and supervises techniques used to control, eliminate and prevent cross infection or other environmental hazards in health care facilities. Establishes standards and work procedures for the housekeeping staff in accordance with the established policies of the facility. Maintains budgets, inventories of supplies and equipment, and personnel hiring practices.

Industrial Hygienist: Conducts programs in industry to measure and to help control, eliminate, and prevent occupational hazards and diseases.

HEALTH EDUCATION personnel acquaint groups and individuals with the standards of optimum health and the principles of achieving and maintaining optimum health.

School Health Educator: Teaches elementary, secondary, and college students principles of personal health sciences, total fitness, family living, consumer and environmental health, and community health trends and resources.

HEALTH PROFESSIONS

Public Health Practitioner: Professionally trained to work in a public health capacity.

INFORMATION AND COMMUNICATION personnel apply a communications orientation to the development, presentation, organization, and recording of medical facts and material for the benefit of medical personnel and the general public.

Medical Library Assistant: Combines training in library technology and health subjects to assist medical librarians in the process of acquiring, organizing, cataloguing, retrieving, and disseminating medical information.

MEDICAL INSTRUMENTATION AND MACHINE OPERATION personnel maintain and/or operate equipment and instruments that supplement and support body functions or that provide diagnostic or therapeutic services.

Cardiopulmonary Technician: Performs a wide range of tests related to the functions and therapeutic care of the heart-lung system, operates and maintains a heart-lung machine for extracorporeal circulation, assists in cardiac catheterization and cardiac resuscitation, and assists in the postoperative monitoring, care, and treatment of heart-lung patients.

Electroencephalographic Technologist/Technician: Operates and maintains electroencephalographic machines, recording brain waves on a graph to be used by physicians in the diagnosis of brain disorders.

MEDICAL RECORD personnel plan, organize, and manage patient information systems and statistical reports for medical and administrative staff use and health care research.

Medical Record Technician: Serves as the skilled assistant to the medical record administrator, carrying out the technical work of coding, analyzing, and preserving patients' medical records and compiling reports, disease indices, and statistics in health care institutions.

Medical Transcriptionist: Is skilled in typing, medical spelling, medical terminology, and the proper format of medical records and reports; is prepared to transcribe medical dictation using mechanical dictating equipment.

MENTAL HEALTH personnel assist the health professions in the prevention and treatment of mental disorders through recreational, occupational, and educational programs.

Human Services Technologist/Technician: Employs skills as a generalist, based upon knowledge of human behavior and social problems in settings providing mental health and social rehabilitation services; employs a whole person, noncustodial approach to treating the symptomatic and causative elements that affect the individual's ability to respond to the social environment.

Mental Health Associate/Technician/Assistant: Works under the supervision of professional personnel in supplementing physical care for persons with emotional problems through recreational, occupational, and re-adjustment activities, including participation in group therapy with clients and families; refers patients to community agencies, and visits patients after their release from an institution.

Mental Health Technologist: Works with other mental health professionals in diagnosing psychiatric disorders, counseling, and planning treatment for the emotionally disturbed or mentally retarded.

Mental Retardation Aide: Works under the supervision of a professional staff in attending to the physical needs and well-being of mentally retarded patients and in assisting with teaching and recreation processes.

Psychiatric Technician: Works under the supervision of professional and/or technical personnel in caring for emotionally ill patients in a psychiatric medical care facility; assists in carrying out the prescribed treatment plan for the patient; maintains consistent attitudes in communicating with the patient in keeping with the treatment plan, and carries out assigned individual and group activities with patients. (Psychiatric Aide)

NUCLEAR MEDICINE personnel prepare or use radioactive nuclides in laboratory procedures, scanning-imaging, and function studies for diagnostic, therapeutic, and research purposes.

Nuclear Medicine Technologist/Technician: Performs a wide variety of diagnostic tests in human beings and/or body fluids utilizing radioactivity and/or stable nuclides. Also applies radioactivity in the course of treatment. Makes independent judgments under the general guidance of a nuclear medicine physician.

NURSING AND RELATED SERVICES personnel assist the physician in bedside patient care and provide specialty services as required by institutional and community needs.

Nurse (L.V.N.): Renders general nursing care to patients in hospitals, infirmaries, sanitariums, or similar institutions. Administers prescribed medications and treatments.

Nurse (R.N.): Provides general medical care and treatment to assigned patients in facilities, working with a physician. Performs physical exams and preventive health measures within prescribed guidelines. Orders, interprets, and evaluates diagnostic tests. Recommends drugs and treatment.

Operating Room Technician: Works as general technical assistant on the surgical team by arranging supplies and instruments in the operating room, maintaining antiseptic conditions, preparing patients for surgery and assisting the surgeon during the operation.

Geriatric Care Worker: Administers to the needs of aged patients, bringing to the task an understanding of the problems of institutionalization, economic needs, and attitudes toward the elderly as these concepts relate to this specific population.

PHARMACY SERVICES personnel assist the pharmacist in selected activities in pharmacy departments to provide pharmaceutical services to patients, nurses, and physicians.

Pharmacy Technician: Assists the pharmacist in selected activities including medication profile reviews for drug incompatibilities, typing prescription labels, prescription packaging, handling of purchase records, inventory control, and may, where hospital policy and state law permit, administer drugs to patients under the supervision of a registered pharmacist.

PHYSICIAN EXTENDER personnel render direct and specific assistance to the physician specialist and general practitioner in clinical and research endeavors, taking medical histories, performing detailed physical examinations, and conducting visual, auditory, developmental, and laboratory tests.

Physician Assistant-Primary Care: Performs physician-delegated functions in the areas of general practice, including family medicine, internal medicine, pediatrics, obstretrics, and emergency medicine.

Physician Assistant-Specialty: Performs functions delegated by a clinical specialist in specific areas of patient care: urology, surgery, pathology, orthopedics, etc.

PODIATRIC SERVICES personnel work under the direct supervision of the podiatrist, performing supplementary duties for the foot specialist.

Podiatric Assistant: Supports the podiatrist in his service to patients by preparing patients for treatment, sterilizing the instruments, performing general office duties, and assisting the podiatrist in preparing dressings, administering treatments, and developing x-rays.

RADIOLOGICAL SERVICES personnel use ionizing radiation for diagnostic, therapeutic, and research purposes.

Radiation Therapy Technologist/Technician: Administers x-rays and electron beam equipment in order to treat disease in patients and assists in preparing and handling radioactive materials for therapy purposes.

Radiologic Technologist/Technician: Maintains and safely uses equipment and supplies necessary to demonstrate portions of the human body on x-ray film or fluoroscopic screen for diagnostic purposes. May supervise and/or teach radiologic personnel. (X-Ray Technician)

REHABILITATION-OCCUPATIONAL personnel use work-related skills in treating or training patients who are physically or mentally ill, in preventing disability, in evaluating behavior, and in restoring disabled persons to health, social, or economic independence.

Occupational Therapy Assistant: Works under the supervision of an occupational therapist in evaluating clients, planning and implementing programs designed to restore or develop a client's self care, work, and play/leisure time task performance skills. Although the assistant requires supervision in conducting a remedial program, he or she can function independently when conducting a maintenance program.

REHABILITATION-PHYSICAL personnel use physical agents, assistive devices, and therapeutic exercise for the prevention of disease and disability and toward restoration of function to disabled persons.

Orthotist/Prosthetist: Writes specifications for, makes, fits, and repairs braces and appliances and/or artificial limbs following the prescription of physicians.

Orthotics/Prosthetics Technician: Fabricates, fits, maintains, and repairs orthoses or prosthetics devices under guidance of an orthotist or prosthetist.

Orthopedic Technician: Sets up traction rooms, applies all types of traction, makes casts, applies splints, and may train patients to operate a circle-o-bed.

Physical Therapy Assistant: Assists the physical therapist by assembling equipment, carrying out specified treatment programs, and helping with complex treatment procedures. Other duties include responsibility for the personal care of patients, safety precautions, routine clerical and maintenance work.

RESPIRATORY THERAPY SERVICES personnel, under medical direction, treat, manage, control, and perform diagnostic evaluations in the care of patients with deficiencies and abnormalities in the cardio-pulmonary system.

Respiratory Therapist: Administers respiratory care under the direction of a physician, evaluating the patient's progress and making recommendations for respiratory therapy. His or her proficiencies include ventilatory therapy, cardio-respiratory rehabilitation, microenvironmental control, and diagnostic testing of the respiratory system. (Inhalation Therapist, Registered Respiratory Therapist)

Respiratory Therapy Technician: Routinely treats patients requiring non-critical respiratory care and recognizes and responds to a limited number of specified patient respiratory emergencies.

SOCIAL SERVICES AND COUNSELING personnel use individual or group counseling techniques and/or provide services offered by social agencies to assist individuals in personal and/or social adjustment.

Alcohol/Drug Abuse Specialist: Advises and assists people in their efforts to overcome personal, family, and social problems that are manifested in alcoholism and drug addiction.

Community Health Worker: Assists people in the community with medical, social, or mental health problems in finding and utilizing sources of available help.

Homemaker/Home Health Aide: Assists with meals, shopping, household chores, bathing, and the other daily living needs, both physical and emotional, of elderly, ill, or disabled persons, working under professional supervision required by the situation.

Rehabilitation Counselor Aide: Aids the rehabilitation counselor in developing and implementing a rehabilitation plan for an individual; under supervision, may conduct client interviews, locate and file data about employment opportunities, match clients with jobs available, and locate additional individuals in need of counseling or rehabilitation services.

Child Care Worker: Under supervision, implements activity and training programs that provide a preventive and therapeutic environment for mentally ill and emotionally distrubed children and adolescents. Trains children in self-help skills through intensive group sessions involving structured daily activities and reinforcement of other therapeutic experiences; records, evaluates, and reports progress of clients.

VISION CARE personnel work with or carry out the prescriptions of the opthalmologist and optometrist. Their duties include ophthalmic examinations, treatment, and correction of ophthalmic disorders by physical or mechanical measures.

Opthalmic Dispenser: Adapts and fits corrective eyewear as prescribed by the ophthalmologist or optometrist.

Ophthalmic Laboratory Technician: Operates machines to grind lenses and fabricate eyewear to prescription.

Ophthalmic Optician: Grinds lenses and fabricates eyewear, as well as adapts and fits corrective eyewear according to prescription by the opthalmologist or optometrist.

Optometric Assistant/Technician: Assists an optometrist in diversified ways, including general office duties, vision testing patients, administering eye exercises, preparing and fitting corrective lenses, and styling eyewear.

Appendix D

Survey Sampling Design and Response Rates

The Employer Survey

Surveys were sent to a stratified random sample of Los Angeles County employers in the health technologies. The county was divided into five geographic regions: East (the Northeastern telephone directory area), Central (Los Angeles), West (Western, Airport), Valley (Northwestern), and Harbor (South Bay, Mid-Cities, and Long Beach).

Health care employers were classified into ten categories (see below). All general acute care hospitals were sent surveys, since their total number in the County was small and they are major employers of health care personnel. This category was subdivided by size; hospitals with a bed capacity over 200 were considered large, those with a capacity of 100-200 were considered medium-sized, and those with a bed capacity under 100 were considered small. A similar size distinction was made with nursing homes; surveys were sent to all medium and large-sized institutions. A proportional sample was randomly selected of physicians, dentists, opticians and optometrists; a proportional random sample of major businesses and industries (those employing 500 or more) was also selected. All laboratories, clinics, health maintenance organizations, public health departments, and home health agencies were sent surveys.

The initial mailing of 682 surveys was sent in October, 1980, with a follow-up mailing sent in December. Return rates for each category and the total sample were as follows:

Type of Employer	Sample	Sample Minus Undeliverables	Returns	Percent Return
Hospitals	150	133	51	38
Physicians & Dentists	122	101	28	28
Opticians & Optometrists	35	25	13	52
Nursing Homes	86	74	27	36
Laboratories	23	16	7	44
Clinics	142	122	38	31
Health Maintenance Orgs.	11	10	3	30
Public Health Departments	28	25	6	24
Business & Industry	45	31	21	68
Home Health Agencies	40	27	11	41
Total	682	564	205	36

A set of descriptions for each occupational category and specific occupational role accompanied each survey (see Appendix E). The survey instrument was sent out under a cover letter from the Vice Chancellor of Educational Services, and included a stamped return envelope.

The Education Survey

The Education Survey was sent to all postsecondary institutions in Los Angeles County preparing students in nursing and allied health fields. The initial mailing to 162 inst'tutions was sent in September, 1980, with a follow-up mailing to non-respondents sent in October, 1980. The survey form is in Appendix F).

The distribution of institutions by types and their rate of response was as follows:

Institutional Types	Population	Population Less Undeliverables	Returns	Percent Return
Four-year Institutions:	18	17	15	88
University of Calif.	2			
State Colleges & Univ.	5			
Independent Colleges	11			
Community Colleges	23	23	22	96
Hospital Training Progs.	15	15	11	73
Proprietary Schools	37	34	14	41
Occupational Centers	15	14	5	36
Community Adult Schools	46	44	18	41
Skill Centers	8	7	3	43
Total	162	154	88	57

The Delphi Survey

The initial list of experts selected to participate in the survey was acquired from Advisory Committee members. Because these names were few in number and concentrated in the nursing area, additional names were solicited from consultant Judy Grubbs, who specializes in health facilities planning (Ellison, Grubbs & Ellison, Consultants). Several additional names were identified from the Employer Survey. The total number of experts identified was 60.

The first iteration was sent in November; thirteen responses were received for a 22% rate of return. The second iteration was sent in December with 26 responses and a return rate of 43%. Copies of the survey forms are included in Appendices G and H).

Appendix E

LOS ANGELES COMMUNITY COLLEGE DISTRICT
Study of Health Occupational Programs

EMPLOYER SURVEY

The Los Angeles Community College District is evaluating health care personnel needs for the purpose of planning the development of health occupational programs. Occupational categories for which employment information is sought are those for which training can be provided by two-year community college programs. Descriptions of the occupational categories are attached. They are taken from both the American Society of Allied Health Professions' 1975 Inventory of Health Occupations Education Programs and the Department of Labor's Dictionary of Occupational Titles.

Your response to this survey will be most helpful to the District in planning and implementing programs. Your assistance will be very much appreciated.

OCCUPATIONAL CATEGORIES	Current Number of Employees		Annual Number of Openings		Annual Starting Salary	ESTIMATE OF LOCAL SUPPLY OF TRAINED MANPOWER- (Surplus=1, Sufficient=2, Shortage=3)	
	Full-Time	Part-Time	Full-Time	Part-Time		Current	Two Year Projection
ADMINISTRATION AND PLANNING:							
Health Care Assistant Administrator							
Long-Term Care Administrator							
Medical Office Assistant							
Medical Secretary							
Unit Clerk							
Other (please specify)							
BIOMEDICAL ENGINEERING:							
Biomedical Engineering Technician							
Other (please specify							
CLINICAL LABORATORY SERVICES:							
Cytotechnologist							
Histologic Technician							
Laboratory Assistant							
Laboratory Technician							
Other (please specify)							
DENTAL SERVICES:							
Dental Assistant							
Dental Hygienist							
Dental Secretary							

OCCUPATIONAL CATEGORIES	Current Number of Employees		Annual Number Of Openings		Annual Starting Salary	ESTIMATE OF LOCAL SUPPLY OF TRAINED MANPOWER- (Surplus=1, Sufficient=2, Shortage=3)	
	Full-Time	Part-Time	Full-Time	Part-Time		Current	Two Year Projection
DENTAL SERVICES: Dental Technician							
Other (please specify)							
DIETETIC AND NUTRITION SERVICES: Dietetic Technician							
Dietetic Assistant							
Other (please specify)							
EMERGENCY SERVICES: Ambulance Attendant							
Emergency Medical Technician							
Other (please specify)							
ENVIRONMENTAL SERVICES: Environmental Engineering Assistant							
Environmental Health Technician							
Health Care Facilities Housekeeper							
Industrial Hygienist							
Other (please specify)							
HEALTH EDUCATION: School Health Educator							
Other (please specify)							
INFORMATION AND COMMUNICATION: Medical Library Assistant							
Other (please specify)							

OCCUPATIONAL CATEGORIES	Current Number of Employees		Annual Number Of Openings		Annual Starting Salary	ESTIMATE OF LOCAL SUPPLY OF TRAINED MANPOWER- (Surplus=1, Sufficient=2, Shortage=3)	
	Full-Time	Part-Time	Full-Time	Part-Time		Current	Two Year Projection
MEDICAL INSTRUMENTATION AND MACHINE OPERATION: Cardiopulmonary Technician							
Electroencephalographic Technologist/Technician							
Electron Microscopy Technican							
Other (please specify)							
MEDICAL RECORD: Medical Record Technician							
Medical Transcriptionist							
Other (please specify)							
MENTAL HEALTH: Human Services Technologist/ Technician							
Mental Health Associate/ Technician/Assistant							
Mental Health Technologist							
Mental Retardation Aide							
Psychiatric Technician							
Other (please specify							
NUCLEAR MEDICINE: Nuclear Medicine Technologist/ Technician							
Other (please specify)							
NURSING AND NURSING RELATED SERVICES: Nurse (L.V.N.)							
Nurse (R.N.)							
Operating Room Technician							
Geriatric Care Worker							
Other (please specify)							

OCCUPATIONAL CATEGORIES	Current Number of Employees		Annual Number Of Openings		Annual Starting Salary	ESTIMATE OF LOCAL SUPPLY OF TRAINED MANPOWER- (Surplus=1, Sufficient=2, Shortage=3)	
	Full-Time	Part-Time	Full-Time	Part-Time		Current	Two Year Projection
OTHER HEALTH PROFESSIONALS: Public Health Practitioner							
Other (please specify)							
PHARMACY SERVICES: Pharmacy Technician							
Other (please specify)							
PHYSICAL EXTENDER: Physician Assistant Primary Care							
Physician Assistant Specialty							
Other (please specify)							
PODIATRIC SERVICES: Podiatric Assistant							
Other (please specify)							
RADIOLOGICAL SERVICES: Radiation Therapy Technologist/ Technician							
Radiologic Technologist/Technician							
Other (please specify)							
REHABILITATION-OCCUPATIONAL: Occupational Therapy Assistant							
Other (please specify							
REHABILITATION-PHYSICAL Orthopedic Technician							
Orthotics/Prosthetics Technician							
Orthotist/ Prosthetist							

OCCUPATIONAL CATEGORIES	Current Number of Employees		Annual Number Of Openings		Annual Starting Salary	ESTIMATE OF LOCAL SUPPLY OF TRAINED MANPOWER- (Surplus=1, Sufficient=2, Shortage=3)	
	Full-Time	Part-Time	Full-Time	Part-Time		Current	Two Year Projection
REHABILITATION-PHYSICAL Physical Therapy Assistant							
Other (please specify)							
RESPIRATORY THERAPY SERVICES: Respiratory Therapist							
Respiratory Therapy Technician							
Other (please specify)							
SOCIAL SERVICES AND COUNSELING: Alcohol/Drug Abuse Specialist							
Community Health Worker							
Homemaker/Home Health Aide							
Rehabilitation Counselor Aide							
Child Care Worker							
Other (please specify)							
VISION CARE: Ophthalmic Dispenser							
Ophthalmic Laboratory Technician							
Ophthalmic Optician							
Optometric Assistant Technician							
Other (please specify)							

In what areas do you see the need for additional community college support to assist in the educational/training needs of personnel working in the health fields?

Area	Program Type (s)*

*Program Type Key

1 = In-service up-grading
2 = Specialized courses
3 = Certificate program
4 = Workshops
5 = Institutes

Please indicate the title, address, and phone number of your health care organization, and the name of the person filling out the survey.

Title _____

Address _____

_____

Phone _____

Respondent _____

Thank you very much.

92

Appendix F

LOS ANGELES COMMUNITY COLLEGE DISTRICT
Study of Health Occupational Programs

Survey of Educational Programs

The Los Angeles Community College District is carrying out a manpower study of the health occupations in Los Angeles County. To determine the number of students entering the local labor market, information is being requested about the number of allied health and nursing program degrees awarded by your institution.

Please supply information about instructional programs for which an Associate Degree, Certificate, Diploma, or less are awarded. If your institution does not award degrees in any of these occupational areas, simply check here _____ and supply the name and address of your institution on the last page.

List the name of each health occupation program offered by your institution according to its major occupational category. Include any continuing education programs offered. Indicate the number of graduates, whether the program is accredited, and information available about forthcoming changes in the instructional program.

Your response will enable the District to more effectively plan and implement health occupations programs. Thank you for your assistance.

OCCUPATIONAL CATEGORIES (List the name of each health occupation program by area)	Number of Graduates 1978 - 1979		Number of Graduates 1979 - 1980		Is Program Accredited?	If Yes, By What Organization	Changes in Instructional Program 1980 - 1985			
	Associate Degrees	Certificates Diplomas or Less	Associate Degrees	Certificates Diplomas Or Less	Yes Or No		A New Program Will Be Started	Program Will Expand Its Enrollment	Program Will Reduce Its Enrollment	Program Is To Be Canceled
ADMINISTRATION, PLANNING, AND OFFICE										
BIOMEDICAL ENGINEERING										

OCCUPATIONAL CATEGORIES (List the name of each health occupation program by area)	Number of Graduates 1978 - 1979			Number of Graduates 1979 - 1980		Is Program Accredited?	If Yes, By What Organization	Changes In Instructional Program 1980 - 1985			
	Associate Degrees	Certificates Diplomas or Less		Associate Degrees	Certificates Diplomas Or Less	Yes Or No		A New Program Will Be Started	Program Will Expand Its Enrollment	Program Will Reduce Its Enrollment	Program Is To Be Cancelled
CLINICAL LABORATORY SERVICES											
DENTAL SERVICES											
DIETETIC AND NUTRITION SERVICES											
EMERGENCY SERVICES											

OCCUPATIONAL CATEGORIES (list the name of each health occupation program by area)	Number of Graduates 1978 - 1979			Number of Graduates 1979 - 1980		Is Program Accredited?	If Yes By What Organization	Changes In Instructional Program 1980 – 1985		
	Associate Degrees	Certificates, Diplomas, or Less		Associate Degrees	Certificates, Diplomas, Or Less	Yes Or No		A New Program Will Be Started	Program Will Expand Its Enrollment	Program Will Reduce Its Enrollment	Program Is To Be Cancelled
ENVIRONMENTAL SERVICES											
HEALTH EDUCATION AND PUBLIC HEALTH											
INFORMATION AND COMMUNICATION											

OCCUPATIONAL CATEGORIES (list the name of each health occupation program by area)	Number of Graduates 1978 - 1979			Number of Graduates 1979 - 1980		Is Program Accredited?	If Yes By What Organization	Changes In Instructional Program 1980 – 1985			
	Associate Degrees	Certificates Diplomas or Less		Associate Degrees	Certificates Diplomas Or Less	Yes Or No		A New Program Will Be Started	Program Will Expand Its Enrollment	Program Will Reduce Its Enrollment	Program Is To Be Cancelled
MEDICAL INSTRUMENTATION AND MACHINE OPERATION											
MEDICAL RECORD											
MENTAL HEALTH											
NUCLEAR MEDICINE											

OCCUPATIONAL CATEGORIES (list the name of each health occupation program by area)	Number of Graduates 1978 - 1979			Number of Graduates 1979 - 1980		Is Program Accredited?	If Yes, By What Organization	Changes In Instructional Program 1980 - 1985			
	Associate Degrees	Certificates, Diplomas, or Less		Associate Degrees	Certificates, Diplomas, Or Less	Yes Or No		A New Program Will Be Started	Program Will Expand Its Enrollment	Program Will Reduce Its Enrollment	Program Is To Be Cancelled
NURSING AND NURSING-RELATED SERVICES											
PHARMACY SERVICES											
PHYSICIAN EXTENDER											
PODIATRIC SERVICES											

OCCUPATIONAL CATEGORIES (List the name of each health occupation program by area)	Number of Graduates 1978 - 1979			Number of Graduates 1979 - 1980		Is Program Accredited?	If Yes By What Organization	Changes In Instructional Program 1980 - 1985			
	Associate Degrees	Certificates, Diplomas, or Less		Associate Degrees	Certificates, Diplomas, Or Less	Yes Or No		New Program Will Be Started	Program Will Expand Its Enrollment	Program Will Reduce Its Enrollment	Program Is To Be Cancelled
RADIOLOGICAL SERVICES											
REHABILITATION-OCCUPATIONAL											
REHABILITATION-PHYSICAL											
PULMONARY SERVICES (RESPIRATORY THERAPY)											

OCCUPATIONAL CATEGORIES (list the name of each health occupation program in area)	Number of Graduates 1978 - 1979			Number of Graduates 1979 - 1980		Is Program Accredited?	If Yes, By What Organization	Changes in Instructional Program 1980 - 1985			
	Associate Degrees	Certificates, Diplomas Or Less	Associate Degrees	Certificates, Diplomas Or Less	Yes Or No			A New Program Will Be Started	Program Will Expand Its Enrollment	Program Will Reduce Its Enrollment	Program Is To Be Cancelled
SOCIAL SERVICES AND COUNSELING											
VISION CARE											

Please indicate the name, address, and telephone number of your institution, and the name of the person filling out the survey.

Thank you for your assistance.

INSTITUTION: _____

ADDRESS _____

Phone _____

RESPONDENT _____

Appendix G
The Delphi Survey (First Iteration)

FUTURE NEEDS IN ALLIED HEALTH AND NURSING EDUCATION IN LOS ANGELES COUNTY

This is a preliminary exercise for a study which will attempt to identify the future needs in allied health and nursing education in Southern California. A follow-up questionnaire will summarize the results of this round and ask for your assessment of the material. Any future surveys will depend upon the results of the first two.

Medical practices continue to change at a rapid pace. As new trends and new equipment emerge, new skills need to be developed. Training programs soon follow. As you think ahead to the next five years and the changes you foresee in health care, list those allied health occupations which you feel will be emerging. In the right hand column, indicate specific skills or competencies needed by those in the occupation you listed on the left.

Return the form in the self-addressed envelope by December 5, 1980. Any questions should be directed to Nancy Mattice, Research Analyst, Office of Educational Planning and Resource Development, at 628-7788, extension 325.

Thank you for your assistance.

Emerging Health Occupations	Skills and/or Competancies
1. _____	a.) _____
	b.) _____
	c.) _____
2. _____	a.) _____
	b.) _____
	c.) _____
3. _____	a.) _____
	b.) _____
	c.) _____
4. _____	a.) _____
	b.) _____
	c.) _____

5. _____ a.) _____
b.) _____
c.) _____

6. _____ a.) _____
b.) _____
c.) _____

7. _____ a.) _____
b.) _____
c.) _____

8. _____ a.) _____
b.) _____
c.) _____

9. _____ a.) _____
b.) _____
c.) _____

10. _____ a.) _____
b.) _____
c.) _____

11. _____ a.) _____
b.) _____
c.) _____

12. _____ a.) _____
b.) _____
c.) _____

13. _____ a.) _____
b.) _____
c.) _____

Appendix H
The Delphi Survey (Second Iteration)

LOS ANGELES COMMUNITY COLLEGE DISTRICT
ADVISORY COMMITTEE ON HEALTH OCCUPATIONAL PROGRAMS

FUTURE NEEDS IN ALLIED HEALTH AND NURSING EDUCATION IN LOS ANGELES COUNTY

This is the second and final exercise for a study which will attempt to identify the future needs in allied health and nursing education occupational programs in Southern California. This questionnaire summarizes the results of the first round and asks you to rank each of the emerging health occupations in terms of its importance.

INSTRUCTIONS:

1. Read through each list of emerging health occupations supplied by members of the Delphi panel during the first exercise. If there are additional emerging health occupations that you may have overlooked in the first exercise, list them at the end of each occupational area. Blanks are provided.

   An asterisk (*) follows those occupations which would seem to require more than 2 years of undergraduate preparation.

2. Return to the beginning of the survey. In the right hand column next to each occupation write in the rating you would give to each. Your rating should reflect the importance you place on the development or enlargement of an educational program in the health occupation. Use a 1-9 rating scale.

   1 = It is highly unimportant that an educational program be developed or enlarged in this health occupational area.

   2 =

   3 = It is somewhat unimportant.

   4 =

   5 = I don't know or have no opinion.

   6 =

   7 = It is somewhat important.

   8 =

   9 = It is highly important that an educational program be developed or enlarged in this health occupational area.

If the Los Angeles Community College District currently offers a training program in a given occupation, the institution offering the program is noted in parenthesis.

EMERGING HEALTH OCCUPATIONS BY AREA	RATING
1. ADMINISTRATION, PLANNING, AND OFFICE PERSONNEL function at various levels to maintain and operate clinical offices and institutions and to plan for improved health care and delivery.	
a. Clinical Nurse Manager	_____ (1)
b. Coordinator of Nurse Retention	_____ (2)
c. Hospital Central Supply Technician	_____ (3)
d. Nursing Home Administrator	_____ (4)
_____	_____ (5)
_____	_____ (6)
2. BIOMEDICAL ENGINEERING PERSONNEL combine basic engineering and biomedical science in order to design, assemble, and adapt medical devices instruments, and processes to improve the quality and cost in the delivery of medical health care.	
a. Biomedical Engineer*	_____ (7)
b. Biomedical Equipment Repair Technician (City, Valley)	_____ (8)
_____	_____ (9)
_____	_____ (10)

EMERGING HEALTH OCCUPATIONS BY AREA	RATING
3. CLINICAL LABORATORY SERVICES PERSONNEL work in a clinical laboratory setting, collecting, mounting, processing, classifying, and analyzing laboratory specimens.	
a. Histotechnologist	_____(11)
b. Medical Laboratory Technician	_____(12)
c. Phlebotomy Technician	_____(13)
d. Radioimmunoassay Technologist	_____(14)
_____	_____(15)
_____	_____(16)
4. DENTAL SERVICES PERSONNEL render varieties of services to the dentist; they do general office work, laboratory work, and they assist the dentist at the chairside.	
a. Dental Chair Assistant (City)	_____(17)
b. Dental Hygienist (West)	_____(18)
_____	_____(19)
_____	_____(20)
5. DIETETIC AND NUTRITION SERVICES PERSONNEL translate nutritional needs into the selection, purchasing, preparation, and service of appropriate foods, along with maintenance of equipment, sanitation, and cost control. They provide nutritional education to individuals and groups and serve as nuturitional consultants to health facilities and communities.	
_____	_____(21)
_____	_____(22)
6. EMERGENCY SERVICES PERSONNEL administer temporary medical help by responding to, evaluating, and assisting in emergency conditions.	
a. Emergency Medical Assistant II (East)	_____(23)
b. Emergency Medical Technologist/Technician	_____(24)
_____	_____(25)
_____	_____(26)
7. ENVIRONMENTAL SERVICES PERSONNEL inspect, evaluate, and gather data for their use in the design, operation, and control of systems for prevention and elimination of environmental hazards.	
_____	_____(27)
_____	_____(28)
8. HEALTH EDUCATION PERSONNEL acquaint groups and individuals with the standards of optimum health and the principles of achieving and maintaining optimum health.	
a. Community Health Worker	_____(29)
b. Health Careers Counselor	_____(30)
c. New Life Styles Counselor	_____(31)
d. Preventive Health Specialist	_____(32)
_____	_____(33)
_____	_____(34)
9. HEALTH-RELATED TEACHER PREPARATION combines teaching skills and health expertise in preparing: (1) instructors of individuals who are physically disabled, emotionally disturbed, or mentally retarded; and (2) allied health professionals who desire to teach within their specialty area.	
a. College Instructor in hospital emotional care*	_____(35)
_____	_____(36)
_____	_____(37)

EMERGING HEALTH OCCUPATIONS BY AREA	RATING
10. INFORMATION AND COMMUNICATION PERSONNEL apply a communications orientation to the development, presentation, organization, and recording of medical facts and material for the benefit of medical personnel and the general public.	
a. Computer Technologist	_____(38)
b. Medical Librarian Technician	_____(39)
_____	_____(40)
_____	_____(41)
11. MEDICAL INSTRUMENTATION AND MACHINE OPERATION PERSONNEL maintain and/or operate equipment and instruments that supplement and support body functions or that provide diagnostic or therapeutic services.	
a. Computerized Axial Tomography (C.A.T.) Technologist	_____(42)
b. Electrocardiographic Technician (East)	_____(43)
_____	_____(44)
_____	_____(45)
12. MEDICAL RECORD PERSONNEL plan, organize, and manage patient information systems and statistical reports for medical and administrative staff use and health care research.	
a. Medical Record Technician (East)	_____(46)
_____	_____(47)
_____	_____(48)
13. MENTAL HEALTH PERSONNEL assist the health professionsals in the prevention and treatment of mental disorders through recreational occupational, and educational programs.	
a. Coordinator of Emotional Care in hospitals*	_____(49)
_____	_____(50)
_____	_____(51)
14. NUCLEAR MEDICINE PERSONNEL prepare or use radioactive nuclides in laboratory procedures, scanning-imaging, and function studies for diagnostic, therapeutic, and research purposes.	
_____	_____(52)
_____	_____(53)
15. NURSING AND NURSING-RELATED SERVICES PERSONNEL assist the physician in bedside patient care and provide specialty services as required by institutional and community needs.	
a. Bilingual Registered Nurse	_____(54)
b. Gerontology Worker in Senior Center	_____(55)
c. Gerontology Worker in Convalescent Hospital	_____(56)
d. Geriatric Nurse Practitioner	_____(57)
e. Home Health Aide for Elderly	_____(58)
f. Homemaker for Elderly	_____(59)
g. Hospice Specialist for Terminally Ill	_____(60)
h. Neonatal Intensive Care Practitioners	_____(61)
i. Nurse Practitioner	_____(62)
j. Nurse Aide	_____(63)
k. Registered Nurse with Specialty in Care of Dying	_____(64)
l. Registered Nurse with Geriatric Specialty	_____(65)
m. Registered Nurse with Primary Care Specialty	_____(66)
_____	_____(67)
_____	_____(68)
16. PHARMACY SERVICES PERSONNEL assist the pharmacist in selected activities in pharmacy departments to provide pharmaceutical services to patients, nurses and physicians.	
a. Pharmacy Technician	_____(69)
_____	_____(70)
_____	_____(71)

EMERGING HEALTH OCCUPATIONS BY AREA	RATING
17. PHYSICIAN EXTENDER PERSONNEL render direct and specific assistance to the physician specialist and general practitioner in clinical and research endeavours, taking medical histories, performing detailed physical examinations, and conducting visual, auditory, developmental, and laboratory tests.	
a. Physician Assistant	_____(72)
b. Surgical Assistant (Trade)	_____(73)
_____	_____(74)
_____	_____(75)
18. PODIATRIC SERVICES PERSONNEL work under the direct supervision of the podiatrist, performing supplementary duties for the foot specialist.	
_____	_____(76)
_____	_____(77)
19. RADIOLOGICAL SERVICES PERSONNEL use ionizing radiation for diagnostic, therapeutic, and research purposes.	
_____	_____(78)
_____	_____(79)
20. REHABILITATION-OCCUPATIONAL PERSONNEL use work-related skills in treating or training patients who are physically or mentally ill, in preventing disability, in evaluating behavior, and in restoring disabled persons to health, social, or economic independence.	
_____	_____(80)
_____	_____(81)
21. REHABILITATION-PHYSICAL PERSONNEL use physical agents, assistive devices, and therapeutic exercise for the prevention of disease and disability and toward restoration of function to disabled persons.	
a. Enterostomal Therapist*	_____(82)
b. Physical Therapy Assistant (Pierce)	_____(83)
_____	_____(84)
_____	_____(85)
22. OTHER REHABILITATION PERSONNEL apply the principles of rehabilitation to diversified areas of therapeutic technique, such as education, fine arts, and recreation.	
a. Director of Play Therapy in Pediatric Settings*	_____(86)
_____	_____(87)
_____	_____(88)
23. RESPIRATORY THERAPY SERVICES PERSONNEL, under medical direction, treat, manage, control, and perform diagnostic evaluations in the care of patients with deficiencies and absormalities in the cardio-pulmonary system.	
_____	_____(89)
_____	_____(90)
24. SOCIAL SERVICES AND COUNSELING PERSONNEL use individual or group counseling techniques and/or provide services offered by social agencies to assist individuals in personal and/or social adjustment.	
a. Community Health Worker (East)	_____(91)
_____	_____(92)
_____	_____(93)

EMERGING HEALTH OCCUPATIONS BY AREA	RATING
25. SPEECH AND HEARING SERVICES PERSONNEL evaluate, record, habilitate and research speech and hearing disorders in children and adults.	
_____	_____(94)
_____	_____(95)
26. VETERINARY SERVICES PERSONNEL work in the care, use, production, and husbandry of animals in a medical setting.	
_____	_____(96)
_____	_____(97)
27. VISION CARE PERSONNEL work with or carry out the prescriptions of the opthalmologist and optometrist. Their duties include opthalmic examinations, treatment, and correction of ophthalmic disorders by physical or mechanical measures.	
_____	_____(98)
_____	_____(99)

_____
(Signature

Thank you for your participation.

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Appendix I

Membership, the Chancellor's Advisory Committee
on Health Occupational Programs

College Members

° Los Angeles City College:

Ms. Dorothy Y. Hata	Assistant Dean of Instruction
Ms. Joan Hudiburg (alternate)	Associate Professor of Family and Consumer Studies

° East Los Angeles College:

Dr. George A. Wistreich	Chairperson of Life Sciences and Allied Health

° Los Angeles Harbor College:

Ms. Christie O. Ichikawa	Associate Professor and Chairperson of Nursing

° Los Angeles Mission College:

Dr. Thomas G. Lakin (to 9/81)	Dean of Instruction
Mr. Raul Cardoza (from 5/81)	Dean of Instruction

° Los Angeles Pierce College:

Ms. Catherine M. Cameron	Professor and Chairperson of Nursing

° Los Angeles Southwest College:

Ms. Marie Bright	Assistant Professor and Chairperson of Nursing

° Los Angeles Trade-Technical College:

Dr. Jeannette R. Hushaw	Assistant Dean of Insturction
Ms. Betty J. Hartwig (alternate)	Associate Professor of Nursing

° Los Angeles Valley College:

Ms. Loretta M. Worthington	Chairperson of Allied Health
Ms. Anna M. Lawbaugh (alternate)	Professor of Nursing

° West Los Angeles College:

Mr. Leonard W. Isaksen	Chairperson of Earth, Life and Health Sciences

Community Members

Ms. Janet Brady	Director of In-Service Training and Education, Northridge Hospital
Dr. Ann Drice	Instructor of Health Care Systems, California State University at Dominguez Hills
Mrs. Rosemary Jacobson	Specialist in Occupational Education, Californa Community Colleges
Mr. Brent Nielsen	Director of Nursing Resources, Hospital Council of Southern California
Dr. Philip J. Tennis	D.D.S., Los Angeles; Member, American Dental Association

District Members

Ms. Nancy L. Conrath, Committee Chairperson	Coordinator of Research and Planning, Office of Educational Planning and Resource Development
Ms. Nancy J. Mattice (to 12/80)	Research Analyst, Office of Educational Planning and Resource Development
Dr. James L. Fobes (from 5/81)	Research Analyst, Office of Educational Planning and Resource Development; Member, Statewide Allied Health Committee